

Table 3-2. Preliminary Adjustments and Settings (Continued)

Control	Setting
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TURBINE TRANSFER PUMP - SEA LEVEL CALIBRATION TEST

INSTRUMENT CONTROL PANEL

E2	SCREEN SELECT	3 TURBINE TRANSFER PUMP
E30	HI/LOW FLOW SELECTOR	High (Toggle Up)
E31	TURBO BOOST PUMP FLOW	Block (Toggle Down)
E40	RECIRC PUMP MODE SELECT	1 FILL

VALVE CONTROL PANEL

4	TURBINE INLET PRESS/FLOW	Intermediate
5	TURBINE OUTLET PRESS/FLOW	Intermediate

MOTIVE FLOW BOOST PUMP - SEA LEVEL CALIBRATION TEST

INSTRUMENT CONTROL PANEL

E2	SCREEN SELECT	4 MOTIVE BOOST PUMP
E27	MOTOR ROTATION	FWD
E30	HI/LOW FLOW SELECTOR	Low (Toggle Down)
E31	TURBO BOOST PUMP FLOW	Block (Toggle Down)
E35	SPEED CONTROL	0 RPM
E40	RECIRC PUMP MODE SELECT	1 FILL

VALVE CONTROL PANEL

4	TURBINE INLET PRESS/FLOW	Intermediate
5	TURBINE OUTLET PRESS/FLOW	Fully Closed
6	BOOST INLET REGULATOR	Low Pressure (Partially Open)
8	LOW ENGINE FLOW ADJUST	Fully Closed
9	ENGINE FLOW ADJUST	Fully Closed
10	AB DISCHARGE FLOW ADJUST	Intermediate
14	LOW DISCHARGE FLOW ADJUST	Fully Closed
21	OIL SUPPLY SHUTOFF	Fully Closed

1. Verify procedure specified in section 3-24 (power-on status) is complete.
2. Close and secure UUT Tank (Item 509) door. Indicator lights DOOR INTERLOCK and RECIRC PUMP INTERLOCK (Items E10, E11) come on.
3. Select FILL mode, using RECIRC PUMP MODE SELECT selector switch (Item E40). Indicator light FILL MODE (Item E17) comes on.
4. Pull (on) RECIRC PUMP circuit breaker (Item E37), to start fill pump. (See applicable test for required UUT Tank level.) Indicator light TEST TANK LOW LEVEL (Item E12) goes out after fluid exceeds the low level shutoff point.

5. Adjust UUT Tank fluid level, utilizing RECIRC PUMP MODE SELECT selector switch (Item E40) by selecting RUN or DRAIN mode.

3-27. RECIRCULATE UUT TANK FLUID.

1. Select RUN mode using RECIRC PUMP MODE SELECT selector switch (Item E40). Indicator light RECIRC MODE (Item E25) comes on, and FILL MODE (Item E17) goes out.

2. Pull (on) RECIRC PUMP circuit breaker (Item E37), to start recirculation pump if pump is not already on.

3-28. DRAIN UUT TANK FLUID.

1. Select DRAIN mode using RECIRC PUMP MODE SELECT selector switch (Item E40).

2. Pull (on) RECIRC PUMP circuit breaker (Item E37), to start the pump if pump is not already on.

3. Pump will turn off after tank is drained.

3-29. INLET BOOST PUMP OPERATION.

NOTE

DOWN
The recirculation pump must be operating for the inlet boost pump to operate.

1. Pull (on) BOOST PUMP circuit breaker (Item E38), to start the boost pump.

2. If HI/LOW FLOW SELECTOR switch (Item E30) is positioned to LOW (toggle down), adjust BOOST INLET REGULATOR valve (Item 6) for desired inlet pressure.

adjust to 7-11 psig

3-30. LUBE PUMP OPERATION.

1. Connect the required lube oil circuit connections to ports (Items 205, 206).

2. Close OIL SUPPLY SHUTOFF valve (Item 21) fully.

3. Pull (on) LUBE OIL PUMP circuit breaker (Item E36) to start lube pump.

4. Open OIL SUPPLY SHUTOFF valve (Item 21) for desired lube pump pressure/flow.

3-31. A/C DRIVE OPERATION.

NOTE

The inlet boost pump and the lube pump must be operating for the A/C drive to operate.

1. Set the SPEED CONTROL potentiometer (Item E35) to zero.
2. Pull (on) the AC DRIVE switch (Item E34) to start A/C drive.
3. Slowly adjust SPEED CONTROL potentiometer (Item E35) to increase and decrease drive speed (RPM).

3-32. HYDROMETER OPERATION.

1. The recirculation pump must be operating and must also be in the FILL or RUN mode to fill (force fluid into) the hydrometer housing (Item 405).
2. Insure the hydrometer vent plug is removed from the hydrometer vent line.
3. Close the hydrometer needle valve located on the rear panel.

NOTE

The needle valve drains the fluid from the housing into the main reservoir; therefore, the needle valve must be closed to fill the hydrometer housing.

4. Throttle the recirculation return shutoff valve (Item 524) to create the required back pressure to fill the hydrometer housing.

NOTE

The recirculation return shutoff valve is located on the rear of the UUT Tank.

5. Fill the housing until the hydrometer floats.

NOTE

The housing will continue to fill until the hydrometer needle valve is opened at which time the fluid will start to drain.

6. Record the specific gravity of the fluid.
7. After test completion, perform the following:
 - a. Open the hydrometer needle valve to drain the fluid from the hydrometer housing.
 - b. Adjust the recirculation return shutoff valve to its initial setting by fully opening the recirculation return shutoff.

3-33. MAIN FUEL PUMP (MFP) DRIVE ADAPTER TORQUE TARE VALUE.

3-34. This tare test determines the additional torque generated by the motive drive oil adapter (74D462092). When pressurized (by lube oil), the adapter seals

generate torque which must be subtracted from the total system torque (displayed on the CRT video monitor (Item E1)) to yield the main fuel pump actual torque as shown below.

NOTE

MFP torque = Total system torque minus motive drive oil adapter torque.

1. Connect the applicable lines and adapters as shown in figure 3-3.
2. The recirculation pump, inlet boost pump, and lube pump must be operating.
3. Set the lube pressure for 40 ± 5 PSIG.
4. Adjust the A/C drive speed to $7,920 \pm 20$ RPM as described in section 3-31.
5. Record the torque value.

NOTE

- This represents the motive drive oil adapter (74D462092) torque.
- Subtract this value from the system total torque to yield the MFP torque.

3-35. MOTIVE FLOW BOOST PUMP (MFBP) DRIVE ADAPTERS TORQUE TARE VALUE.

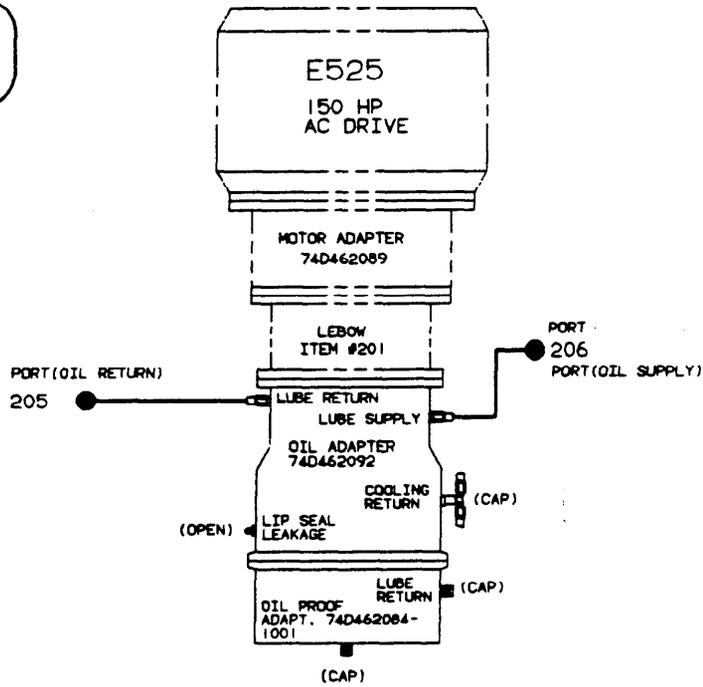
3-36. This tare test determines the additional torque generated by the motive drive oil adapter (74D462092) and the motive flow boost pump drive adapter (74D462081). When pressurized, the adapter's seals generate torque which is added to the motive flow boost pump actual torque. The motive drive oil and motive flow boost pump adapters generated torque must be subtracted from the total system torque (displayed on the CRT video monitor (Item E1)) as shown below.

NOTE

MFBP torque = Total system torque minus (motive drive oil adapter torque plus MFBP drive adapter torque)

1. Connect the applicable lines and adapters as shown in figure 3-4.
2. The recirculation pump, inlet boost pump, and lube pump must be operating.
3. Set the lube pressure for 30 ± 5 PSIG.

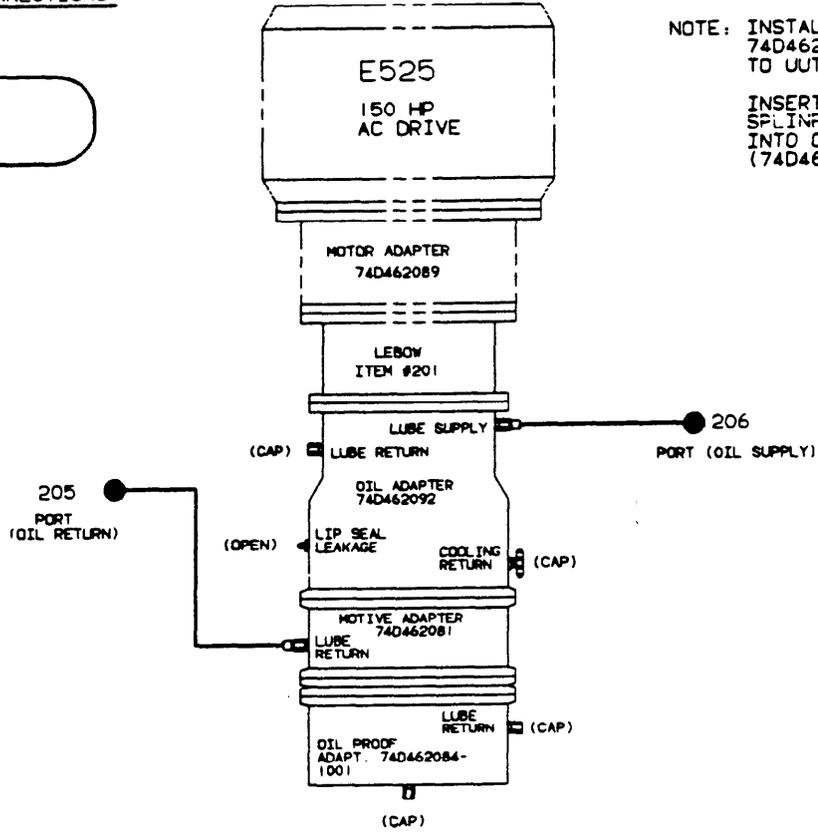
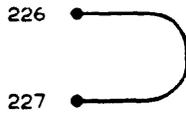
LINE CONNECTIONS



MFP-1

Figure 3-3. Main Fuel Pump Tare Torque Test Setup Schematic

LINE CONNECTIONS



NOTE: INSTALL TUBE
74D462085-1001
TO UUT TANK INLET

INSERT MFBP ADAPTER
SPLINE (74D462093)
INTO OIL ADAPTER
(74D462092)

MFBP-1

Figure 3-4. Motive Flow Boost Pump Tare Test Setup Schematic

4. Adjust the A/C drive speed to 5,600 +/- 20 rpm as described in section 3-31.

5. Record the torque value.

NOTE

- This represents the motive drive oil adapter (74D462092) torque plus the MFBP drive adapter torque.
- Subtract this value from the system total torque to yield the MFP torque.

6. Set the lube pressure for 40 +/- 5 PSIG.

7. Repeat steps 4 and 5 at 8,000 RPM.

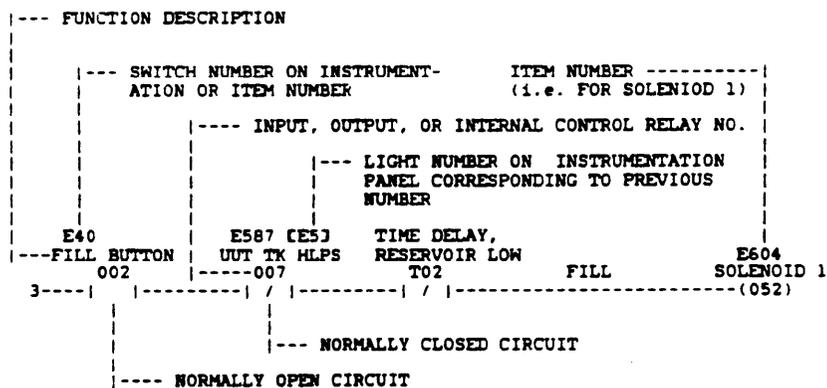
3-37. PROGRAMMABLE CONTROLLER LOGIC DIAGRAM.

3-38. Table 3-3 contains the programmable controller logic diagram. The logic diagram shows the conditions required to energize the electrically operated components, relays, and lights. All conditions are shown in the de-energized state, therefore energy (i.e., selecting a toggle switch) changes the state (open circuit to a closed circuit, or vice-versa). Abbreviations and designation of symbols used herein are as follows:

Abbreviations

HLPS - High Level Pressure Switch	SEC - Second
LK - Lock	SOL - Solenoid
LLPS - Low Level Pressure Switch	TK - Tank
PS - Pressure Switch	TS - Temperature Switch
REL - Relief	

Designation of Symbols and Numbers



NOTE

All components, switches, and light numbers are equivalent to the hydraulic schematic (74D462069) and parts list item numbers.

Table 3-3. Programmable Controller Logic Diagram

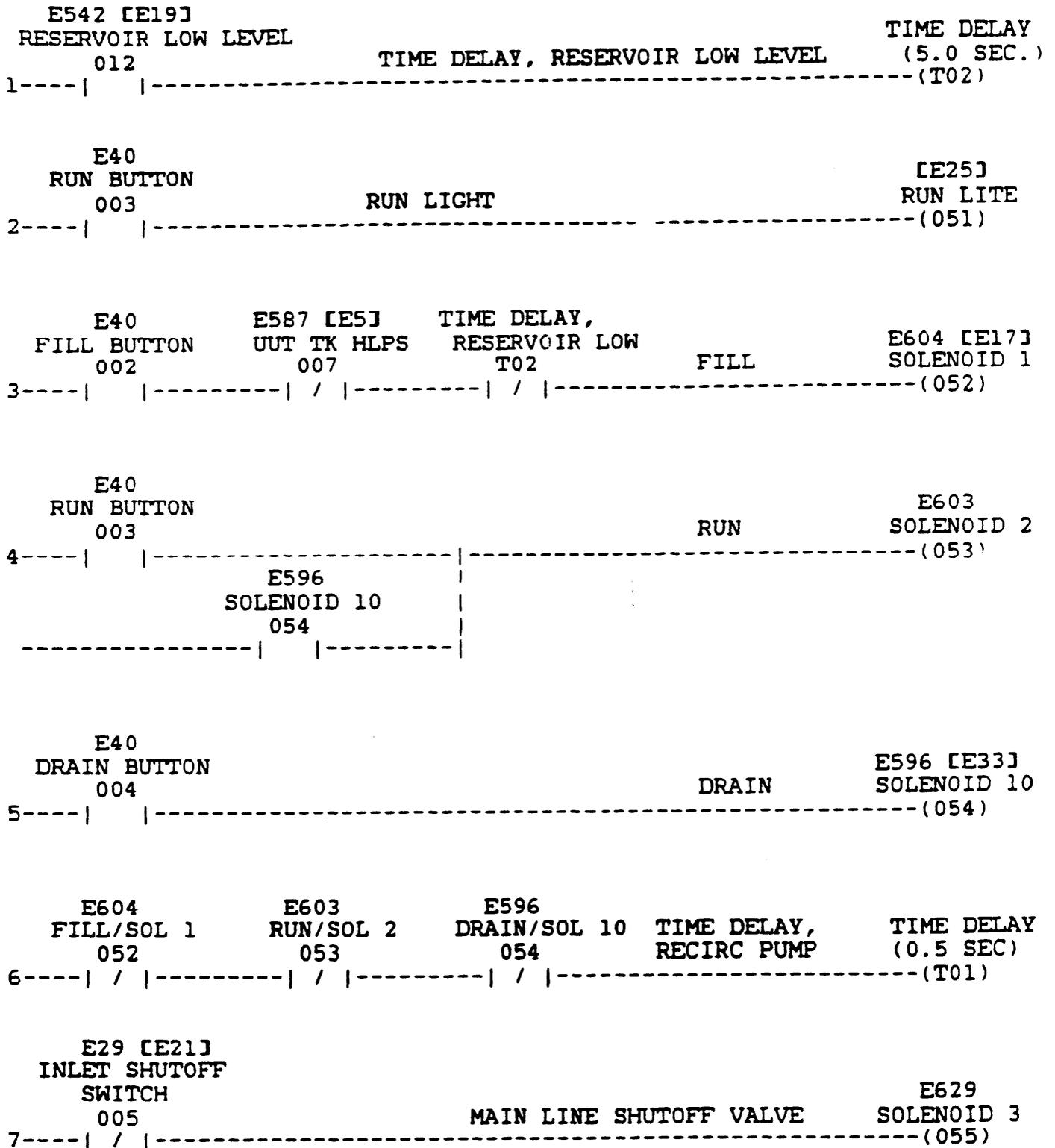


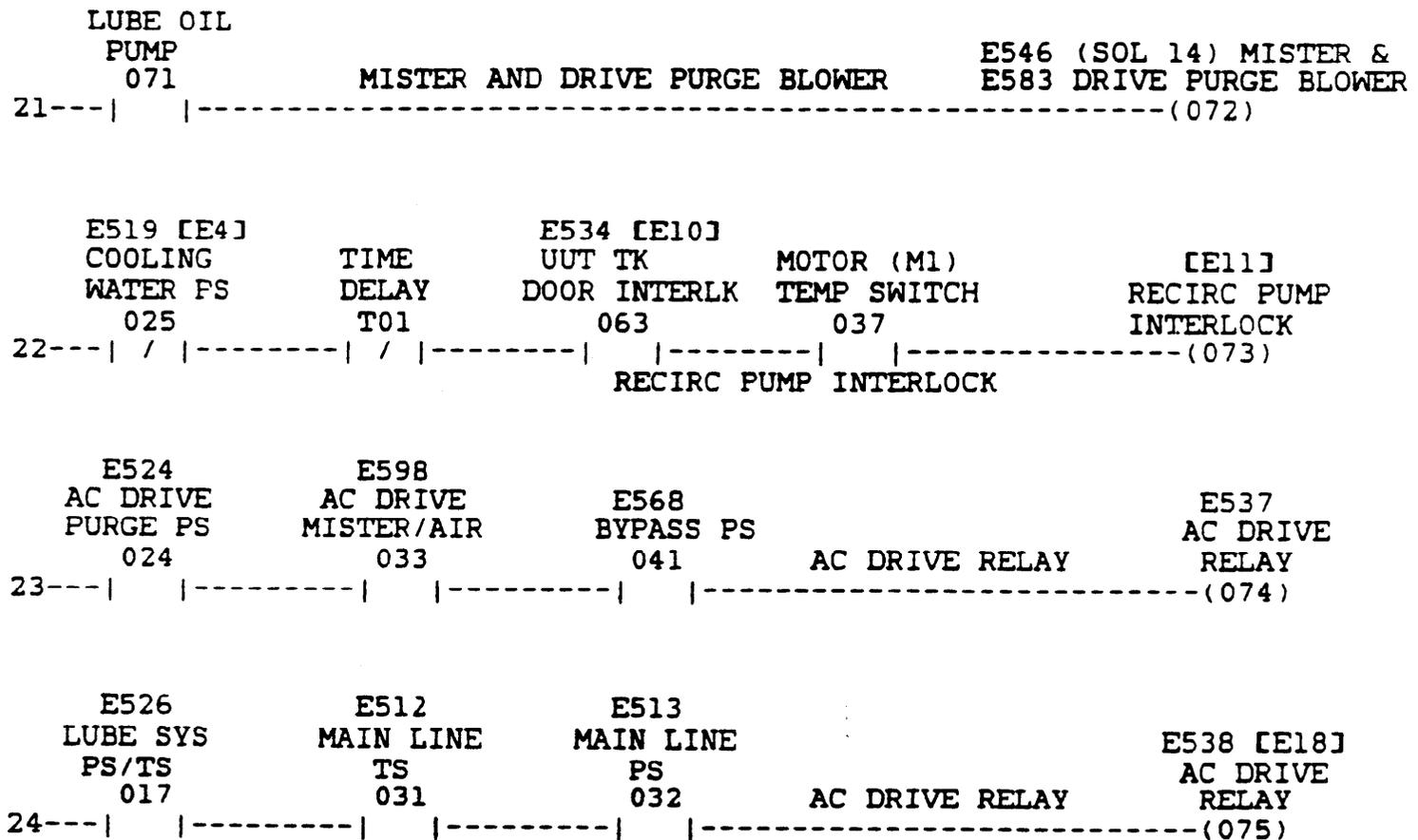
Table 3-3. Programmable Controller Logic Diagram (Continued)

E31	TURBO BOOST PUMP HIGH FLOW SWITCH 006	TURBO BOOST PUMP HIGH FLOW SELECT	E545 [E23] SOLENOID 5 ----- (056)
8----		-----	
E32	MAIN DISCHARGE REL. DISABLE SWITCH 027	SYSTEM SAFETY RELIEF, MAIN DISCHARGE	E547 [E24] SOLENOID 6 ----- (057)
9----		-----	
E15	COOLING FLOW ORIFICE BLOCK SWITCH 030	COOLING FLOW ORIFICE SELECT	E510 [E8] SOLENOID 7 ----- (060)
10----		-----	
E13	SERVO FLOW ORIFICE BLOCK SWITCH 010	SERVO FLOW ORIFICE SELECT	E507 [E6] SOLENOID 8 ----- (061)
11----		-----	
E14	SERVO RETURN FLOW BLOCK SWITCH 011	SERVO RETURN FLOW ORIFICE SELECT	E503 [E7] SOLENOID 9 ----- (062)
12----		-----	
E40	FILL BUTTON 002	TIME DELAY T00	E540 DOOR INTERLOCK 020 SWITCH
13----		/ -----	UUT TK DOOR INTERLOCK E534 [E10] DOOR LOCK ----- (063)
E534	UUT TK DOOR LOCK 063		
-----		-----	
E533 [E12]	UUT TK LLPS 021		
-----	/ -----		

Table 3-3. Programmable Controller Logic Diagram (Continued)

14	E40 [E33] DRAIN BUTTON 004	E533 [E12] UUT TANK LLPS 021	TIME DELAY, UUT TANK DOOR INTERLOCK (T00)	TIME DELAY (25 SEC.) (T00)
	E40 RUN BUTTON 003			
15	E30 HIGH/LOW FLOW FLOW SWITCH 022	HIGH/LOW FLOW SELECT		E548 [E22] SOLENOID 11 (064)
16	E16 SPARE SWITCH 023	SPARE SWITCH		[E9] SPARE LIGHT (065)
17	E37 RECIRC PUMP SWITCH 013	RECIRC PUMP INTERLOCK 073	RECIRC PUMP (ON)	E523 RECIRC PUMP (066)
18	E38 BOOST PUMP SWITCH 014	RECIRC PUMP 066	MOTOR (M2) TEMP SWITCH 040	E502 UUT TK TEMP SWITCH 034
				E629 PUMP INLET 055
				E532 BOOST PUMP (067)
			MAIN LINE BOOST PUMP	
19	E39 PROOF PUMP SWITCH 015	MOTOR (M3) TEMP SWITCH 035	TIME DELAY RESERVOIR LOW LEVEL T02	PROOF PRESSURE PUMP (ON)
				E531 PROOF PRESS. PUMP (070)
20	E36 LUBE OIL PUMP SWITCH 016	E543 [E20] LUBE OIL LEVEL SWITCH 026	E519 [E4] COOLING WATER PS 025	LUBE OIL PUMP (ON)
				E535 LUBE OIL PUMP (071)

Table 3-3. Programmable Controller Logic Diagram (Continued)



3-39. OPERATING TEST PROCEDURES.

3-40. Operating procedure data is provided for each pump and test requirement. Test data, and data record sheets are provided. Preparing for Operation procedures 3-20 and 3-21, shall be performed as required before starting operation.

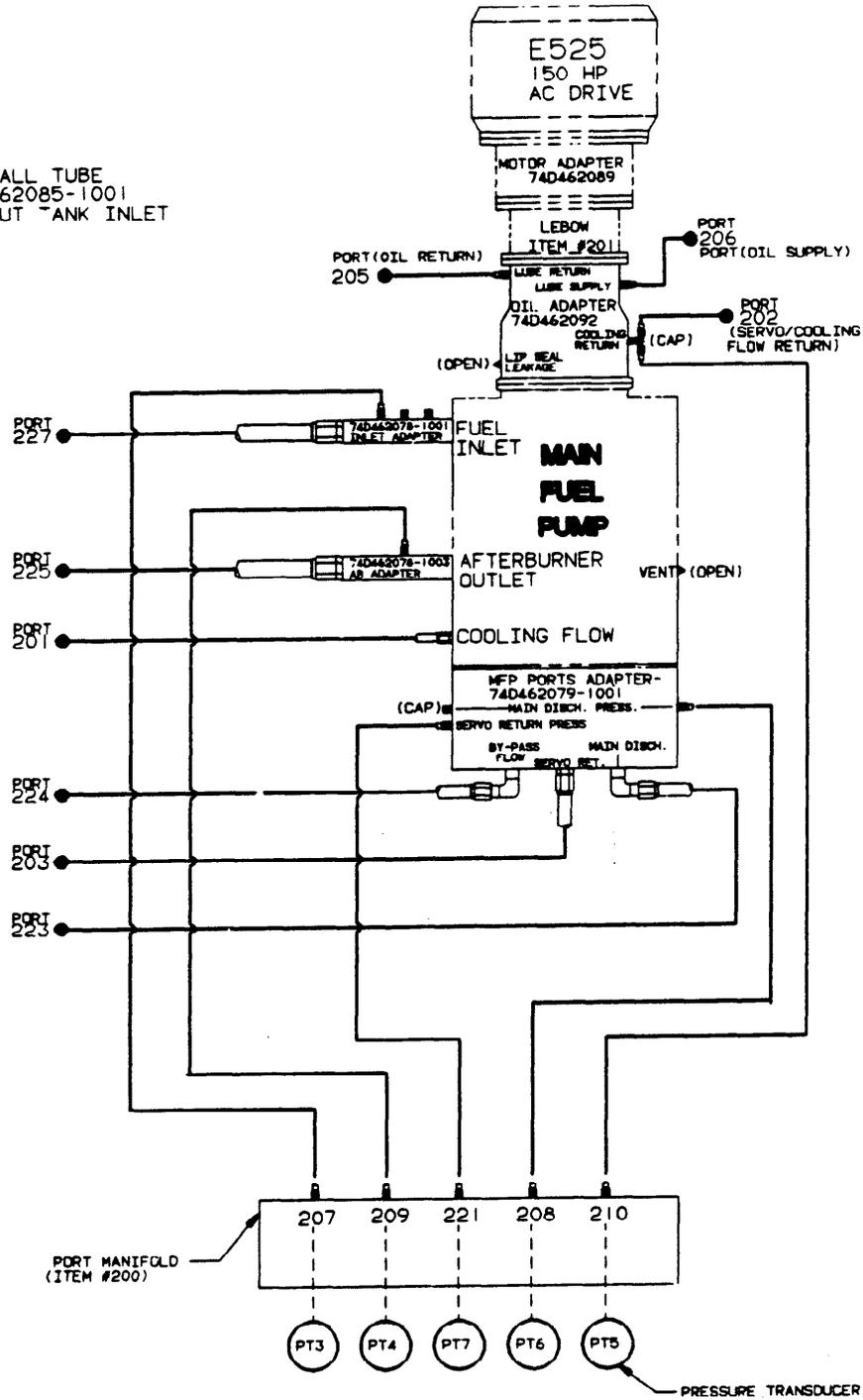
3-41. The following operation procedures are provided to perform functional performance testing on the fuel pumps listed in Section I at depot level. Successful completion of the operating procedures verifies proper operation of the test pumps. Apply facility power per paragraph 3-24.

3-42. MAIN FUEL PUMP - SEA LEVEL CALIBRATION TEST.

3-43. TEST SETUP.

1. Install the test unit and associated plumbing connections as specified in sections 3-22, 3-23 and figure 3-5.

NOTE: INSTALL TUBE
74D462085-1001
TO UUT TANK INLET



74D462084

Figure 3-5. Main Fuel Pump Test Setup Schematic

- a. Insure the UUT Tank plug is not installed as specified in section 3-26.
 - b. Establish initial control settings as addressed in section 3-25.
 - c. Establish power-up status as described in section 3-24.
2. Fill the UUT Tank (per section 3-26) approximately one-half full.
 3. Set the recirculation pump to the RUN mode as described in section 3-27.
 4. Start the inlet boost pump as described in section 3-29. Allow the system to operate for twenty seconds to purge the system of air.
 5. Use control 6 (BOOST INLET REGULATOR) to set and maintain the MFP inlet pressure to 20 +/- 5 PSIG throughout the test.

NOTE

Control 6 will require readjustment after the RPM is increased.

6. Start the lube pump as described in section 3-30. Use control 21 to set and maintain the inlet lube pressure to 40 +/-5 PSIG throughout the test.
7. Start the A/C drive as described in section 3-31.
8. Maintain the inlet fluid temperature between 70 to 80 degrees F. Adjust inlet temperature with temp controllers 411 and 412 if required.

3-44. TEST CONDITIONS.

3-45. Tables 3-4 and 3-5 provide a test data record sheet and test conditions, for operational checkout of the stand only. Refer to NAVAIR Technical Manual A1-762AA-MDB-300 when conducting MFP performance test.

1. Control each test condition's pressures and flows with the following control valves.
2. Use control 6 (BOOST INLET REGULATOR) to adjust the MFP inlet pressure (20 +/- 5 PSIG throughout the entire test).
3. Use control 8 (LOW ENGINE FLOW ADJUST) to adjust the engine flow (Wf (low)) during test conditions 1 and 6 only of table 2 of NAVAIR Technical Manual A1-762AA-MDB-300. Close control 9 after fully opening control 8.
 - a. Record flow from main discharge (Wd) low flow display on the CRT screen.
 - b. After test completion, open control 9 and close control 8 prior to increasing flow.

Table 3-4. Main Engine Fuel Pump Sea Level Calibration Test Data Record Sheet

SPEED RPM +/- 0.25%	FLOWS - GPM										PRESSURES - PSID				INPUT TORQUE LB. IN MAX
	PD-PAB +/- 0.5%	AFTER BURNER WAB +/- 0.5%	BYPASS WB +/- 0.5%	SERVO RETURN WSR +/- 0.5%	SERVO WS +/- 0.5%	COOLING WC +/- 0.5%	MAIN DISCHARGE WD +/- 0.5%	VF +/- 0.5%	PCR-PA MAX/MIN	PSR-PA MAX/MIN	PAB-PA MAX/MIN	PSID			
792	230	0	0	0.5 MIN	0	(2)	RECORD (3) 2.0 MIN								(4)
ACTUAL							(NEW) 1.9 MIN C (SERVICE)								
7920	130	0	0	(2)	(2)	(2)	RECORD 48.5 MAX (1)								
ACTUAL															
7920	1200	0	0	(2)	(2)	(2)	RECORD (1) 39.8 MIN (NEW) 39.3 MIN (SERVICE)								
ACTUAL															
7920	1200	80.3	AR	6.4	9	1.5	RECORD (AS RECD) 39.8 MIN (NEW) 39.3 MIN (SERVICE)	25.9	RECORD	RECORD	RECORD	RECORD	RECORD	RECORD	RECORD
ACTUAL															

NOTES: (1) Vane pump flow limits.
 (2) Flow through orifice only.
 (3) Use control 8 to adjust flow. Open control 8 and close control 9. After test condition completion, open control 9 and close control 8 prior to increasing flow.
 (4) Correct for MFP adapter torque as described in section 3-33.
 5 This record sheet shall not be used for testing the Main Fuel Pump.
 Refer to NAVAIR Manual A1-762AA-MDB-300 for Main Fuel Pump Testing.

MFP DRIVE ADAPTER TORQUE TEST
 Adapter torque at 7,920 RPM - IN LB

Table 3-5. Main Engine Fuel Pump Test Conditions

PRESSURE PSID	FLOWS - GPM										PRESSURES - PSID					INPUT TORQUE LB. IN MAX	
	AFTER BURNER	BYPASS	SERVO RETURN	SERVO WS	COOLING WC	MAIN DISCHARGE	PCR-PA MAX/MIN	PSR-PA MAX/MIN	PAB-PA MAX/MIN	WT +/- 0.5%							
792	0	0	0.5 MIN	0	(2)	RECORD (3)											
130	0	0	(2)	(2)	(2)	RECORD	48.5										
1200	0	0	(2)	(2)	(2)	RECORD	(1)	39.8 MIN									
7920						(SERVICE)		39.3 MIN									
1200						(SERVICE)		(1)									

- NOTES: (1) Vane pump flow limits.
(2) Flow through orifice only.
(3) Use control 8 to adjust flow. Open control 8 and close control 9. After Test Condition completion, open control 9 and close control 8 prior to increasing flow.
(4) Correct for MFP adapter torque as described in section 3-33.
5 This table shall not be used for testing the Main Fuel Pump.
Refer to NAVAIR Manual A1-762AA-MDB-300 for Main Fuel Pump Testing.

c. Do not flow greater than 10 GPM through the flowmeter.

NOTE

Control 8 is the primary control of discharge pressure (Pd) during test conditions 1 and 6.

4. Use control 9 (ENGINE FLOW ADJUST) to adjust the engine flow (Wf (high)) during all test conditions except conditions 1 and 6 of table 2 of NAVAIR Technical Manual A1-762AA-MDB-300.

a. Record flow from main discharge (Wd) high flow display and the engine flow (Wf) high flow display on the CRT screen.

NOTE

- Control 9 is the primary control of discharge pressure (Pd) during all test conditions except conditions 1 and 6.
- Control 9 is also employed during the 1,400 PSID vane stage rise test condition (conducted immediately after test condition 4).

5. Use control 10 (AB DISCHARGE ADJUST) to adjust the afterburner flow (Wab).

3. Use control 11 (BYPASS FLOW ADJUST) to adjust the bypass flow (monitoring bypass flow is not required).

7. Use control 12 (SERVO FLOW ADJUST) to adjust the servo flow (Ws). Control 17 must be open.

NOTE

Control 17 can also be used to adjust servo flow.

8. Use control 15 (SERVO RETURN FLOW) to adjust the servo return flow (Wsr).

9. Use control 16 (COOLING FLOW ADJUST) to adjust the cooling flow (Wc).

10. Use control 17 (SERVO FLOW PRIMARY ADJUST) to adjust the servo flow (Ws).

NOTE

Control 12 can also be used to adjust servo flow once control 17 is open.

3-46. Correct for MFP Adapter Torque as described in section 3-33.

3-47. TURBINE BOOST PUMP - SEA LEVEL CALIBRATION TEST.

3-48. TEST SETUP.

1. Install the test unit and associated plumbing connections as specified in section 3-22 and figure 3-6.

- a. Insure the UUT Tank plug is installed as specified in section 3-26.
- b. Establish initial control settings as addressed in section 3-25.
- c. Establish power-up status as described in section 3-24.

2. Fill the UUT Tank (per section 3-26) to the desired fluid level as follows:

Test	UUT Tank Level Inches
Dual Impeller	4 inches (min) above upper impeller (orange zone of UUT Tank fluid indicator scale)
Lower Impeller	2-4 inches above lower impeller (blue zone of UUT Tank fluid indicator scale)
Upper Impeller	2-4 inches above upper impeller (red zone of UUT Tank fluid indicator scale)

3. Set the recirculation pump to the RUN mode as described in section 3-27.

4. Start the inlet boost pump as described in section 3-29. Allow the system to operate for twenty seconds to purge the system of air.

5. Maintain the inlet fluid temperature between 70 to 90 degrees F. Adjust inlet temperature with temp controllers 411 and 412 if required.

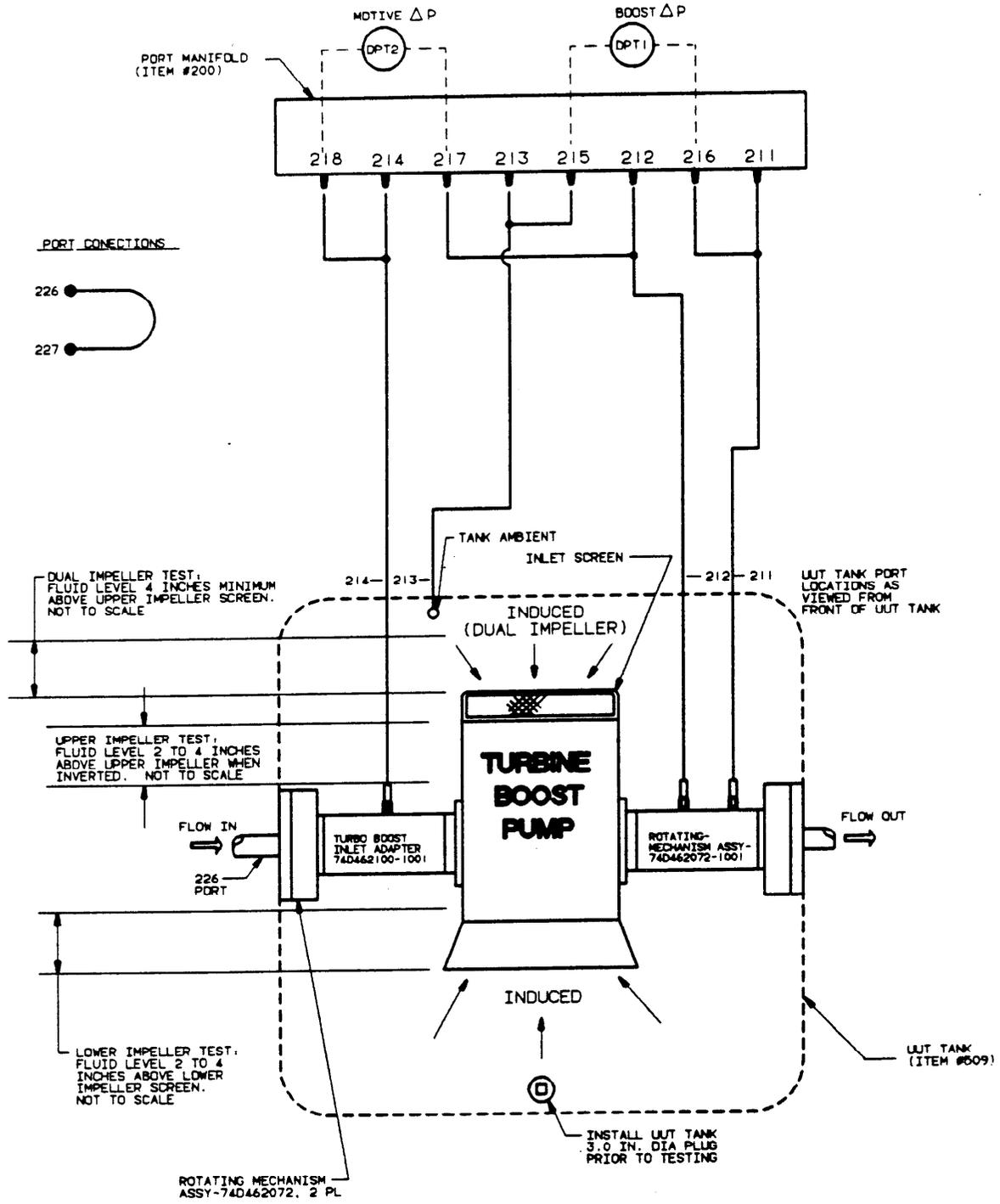
3-49. TEST CONDITIONS.

3-50. Typical test data record sheets are provided in table 3-6. The actual column is where data will be recorded. If required, make a copy of the test data record sheets before performing the test conditions. Refer to Technical Manual TBD when conducting TBP performance test.

3-51. DUAL IMPELLER TEST PROCEDURES.

1. Conduct the TBP Dual Impeller Sea Level Calibration Test as follows:

- a. Set the fluid level as indicated in test setup (orange zone of UUT Tank fluid indicator scale).
- b. Calibrate the test unit per table 3-7 and record the test data (if required) in table 3-6.



74D462085

Figure 3-6. Turbine Boost Pump Test Setup Schematic

Table 3-6. Turbine Boost Pump Sea Level Calibration Test Data Record Sheet

DUAL IMPELLER CONDITION TEST

Test Condition Number	Parameter Description	Requirements			Units
		Minimum	Actual	Maximum	
1	Motive Pressure Drop	79.4	_____	80.4	PSID
	Motive Flow		_____	69.3	GPM
	Induced Flow	218.0	_____	222.0	GPM
	Boost Pressure Rise	5.19	_____		PSID
	Temperature (Fluid)	70	_____	90	°F
2	Motive Pressure Drop	79.4	_____	80.4	PSID
	Motive Flow		_____	69.3	GPM
	Induced Flow	173.0	_____	177.0	GPM
	Boost Pressure Rise	10.38	_____		PSID
	Temperature (Fluid)	70	_____	90	°F
3	Motive Pressure Drop	79.4	_____	80.4	PSID
	Motive Flow		_____	69.3	GPM
	Induced Flow	98.0	_____	102.0	GPM
	Boost Pressure Rise	10.38	_____		PSID
	Temperature (Fluid)	70	_____	90	°F
4	Motive Pressure Drop	79.4	_____	80.4	PSID
	Motive Flow		_____	69.3	GPM
	Induced Flow	19.0	_____	21.0	GPM
	Boost Pressure Rise	10.38	_____		PSID
	Temperature (Fluid)	70	_____	90	°F
5	Motive Pressure Drop	39.4	_____	40.0	PSID
	Motive Flow		_____	48.8	GPM
	Induced Flow	9.5	_____	10.5	GPM
	Boost Pressure Rise	6.75	_____		PSID
	Temperature (Fluid)	70	_____	90	°F
6	Motive Pressure Drop	39.4	_____	40.0	PSID
	Motive Flow		_____	48.8	GPM
	Induced Flow	49.0	_____	51.0	GPM
	Boost Pressure Rise	6.75	_____		PSID
	Temperature (Fluid)	70	_____	90	°F
7	Motive Pressure Drop	100.3	_____	101.3	PSID
	Motive Flow		_____	78.2	GPM
	Induced Flow	17.0	_____	19.0	GPM
	Boost Pressure Rise		_____	25.06	PSID
	Temperature (Fluid)	70	_____	90	°F

Table 3-6. Turbine Boost Pump Sea Level Calibration Test Data Record Sheet
(Continued)

LOWER IMPELLER CONDITION TEST

Test Condition Number	Parameter Description	Requirements			Units
		Minimum	Actual	Maximum	
1	Motive Pressure Drop	79.4	_____	80.4	PSID
	Motive Flow		_____	69.3	GPM
	Induced Flow	<u>183.0</u>	_____	187.0	GPM
	Boost Pressure Rise	2.67	_____		PSID
	Temperature (Fluid)	70	_____	<u>90</u>	°F
2	Motive Pressure Drop	79.4	_____	80.4	PSID
	Motive Flow		_____	69.3	GPM
	Induced Flow	<u>123.0</u>	_____	127.0	GPM
	Boost Pressure Rise	10.28	_____		PSID
	Temperature (Fluid)	70	_____	<u>90</u>	°F
3	Motive Pressure Drop	79.4	_____	80.4	PSID
	Motive Flow		_____	69.3	GPM
	Induced Flow	<u>69.0</u>	_____	71.0	GPM
	Boost Pressure Rise	10.28	_____		PSID
	Temperature (Fluid)	70	_____	<u>90</u>	°F
4	Motive Pressure Drop	79.4	_____	80.4	PSID
	Motive Flow		_____	69.3	GPM
	Induced Flow	<u>19.0</u>	_____	21.0	GPM
	Boost Pressure Rise	10.28	_____		PSID
	Temperature (Fluid)	70	_____	<u>90</u>	°F
5	Motive Pressure Drop	39.4	_____	40.0	PSID
	Motive Flow		_____	48.8	GPM
	Induced Flow	<u>9.5</u>	_____	10.5	GPM
	Boost Pressure Rise	6.68	_____		PSID
	Temperature (Fluid)	70	_____	<u>90</u>	°F
6	Motive Pressure Drop	39.4	_____	40.0	PSID
	Motive Flow		_____	48.8	GPM
	Induced Flow	<u>49.0</u>	_____	51.0	GPM
	Boost Pressure Rise	6.68	_____		PSID
	Temperature (Fluid)	70	_____	<u>90</u>	°F

Table 3-6. Turbine Boost Pump Sea Level Calibration Test Data Record Sheet
(Continued)

UPPER IMPELLER CONDITION TEST

Test Condition Number	Parameter Description	Requirements			Units
		Minimum	Actual	Maximum	
1	Motive Pressure Drop	79.4	_____	80.4	PSID
	Motive Flow		_____	69.3	GPM
	Induced Flow	<u>183.0</u>	_____	187.0	GPM
	Boost Pressure Rise	2.66	_____		PSID
	Temperature (Fluid)	70	_____	<u>90</u>	°F
2	Motive Pressure Drop	79.4	_____	80.4	PSID
	Motive Flow		_____	69.3	GPM
	Induced Flow	<u>123.0</u>	_____	127.0	GPM
	Boost Pressure Rise	① 9.24	_____		PSID
	Temperature (Fluid)	70	_____	<u>90</u>	°F
3	Motive Pressure Drop	79.4	_____	80.4	PSID
	Motive Flow		_____	69.3	GPM
	Induced Flow	<u>69.0</u>	_____	71.0	GPM
	Boost Pressure Rise	10.24	_____		PSID
	Temperature (Fluid)	70	_____	<u>90</u>	°F
4	Motive Pressure Drop	79.4	_____	80.4	PSID
	Motive Flow		_____	69.3	GPM
	Induced Flow	<u>19.0</u>	_____	21.0	GPM
	Boost Pressure Rise	10.24	_____		PSID
	Temperature (Fluid)	70	_____	<u>90</u>	°F
5	Motive Pressure Drop	39.4	_____	40.0	PSID
	Motive Flow		_____	48.8	GPM
	Induced Flow	<u>9.5</u>	_____	10.5	GPM
	Boost Pressure Rise	6.66	_____		PSID
	Temperature (Fluid)	70	_____	<u>90</u>	°F
6	Motive Pressure Drop	39.4	_____	40.0	PSID
	Motive Flow		_____	48.8	GPM
	Induced Flow	<u>49.0</u>	_____	51.0	GPM
	Boost Pressure Rise	6.66	_____		PSID
	Temperature (Fluid)	70	_____	<u>90</u>	°F

NOTE: ① Applicable to Test Stand 74D460160-1001 only.

Table 3-7. Turbine Boost Pump Dual Impeller Test Conditions

Test Condition Number	Motive P -PSID- (Set & Record)	Motive Flow -GPM- (Record)	Induced Flow -GPM- (Set & Record)	Boost P -PSID- (Record)
1	79.4 - 80.4	69.3 Max	218.0 - 222.0	5.19 Min
2	79.4 - 80.4	69.3 Max	173.0 - 177.0	10.38 Min
3	79.4 - 80.4	69.3 Max	98.0 - 102.0	10.38 Min
4	79.4 - 80.4	69.3 Max	19.0 - 21.0	10.38 Min
5	39.4 - 40.0	48.8 Max	9.5 - 10.5	6.75 Min
6	39.4 - 40.0	48.8 Max	49.0 - 51.0	6.75 Min
7	100.3 - 101.3	78.2 Max	17.0 - 19.0	25.06 Max

- c. Use control 4 (TURBINE INLET PRESS/FLOW) to adjust the motive pressure drop.
- d. Use control 5 (TURBINE OUTLET PRESS/FLOW) to adjust the induced flow.

NOTE

To purge the system and pump of air, momentarily set control 4 to the first test condition pressure (80 PSID) and reduce the induced flow (with control 5) to approximately 20 GPM.

3-52. LOWER IMPELLER TEST PROCEDURES.

- 1. Conduct the TBP Lower Impeller Sea Level Calibration Test as follows:
 - a. Do not turn off the inlet boost pump.
 - b. Lower the fluid level as indicated in test setup (blue zone of UUT Tank fluid indicator scale).
 - c. Calibrate the test unit per table 3-8 and record the test data (if required) in table 3-6.
 - d. Use control 4 (TURBINE INLET PRESS/FLOW) to adjust the motive pressure.
 - e. Use control 5 (TURBINE OUTLET PRESS/FLOW) to adjust the induced flow.

Table 3-8. Turbine Boost Pump Lower Impeller Test Conditions

Test Condition Number	Motive P -PSID- (Set & Record)	Motive Flow -GPM- (Record)	Induced Flow -GPM- (Set & Record)	Boost P -PSID- (Record)
1	79.4 - 80.4	69.3 Max	183.0 - 187.0	2.67 Min
2	79.4 - 80.4	69.3 Max	123.0 - 127.0	10.28 Min
3	79.4 - 80.4	69.3 Max	69.0 - 71.0	10.28 Min
4	79.4 - 80.4	69.3 Max	19.0 - 21.0	10.28 Min
5	39.4 - 40.0	48.8 Max	9.5 - 10.5	6.68 Min
6	39.4 - 40.0	48.8 Max	49.0 - 51.0	6.68 Min

3-53. UPPER IMPELLER TEST PROCEDURES.

1. Conduct the TBP Upper Impeller Sea Level Calibration Test as follows:

a. Turn off the inlet boost pump.

CAUTION

Do not rotate the test unit with the inlet boost pump on.

b. Use the turbine position up/down controller (valve 24) to rotate the pump 180 degrees.

c. Lower the fluid level as indicated in test setup (red zone of UUT Tank fluid indicator scale).

d. Calibrate the test unit per table 3-9 and record the test data (if required) in table 3-6.

e. Use control 4 (TURBINE INLET PRESS/FLOW) to adjust the motive pressure drop.

f. Use control 5 (TURBINE OUTLET PRESS/FLOW) to adjust the induced flow (Wi).

NOTE

To purge the system and pump of air, momentarily set control 4 to the first test condition pressure (80 PSID) and reduce the induced flow (with control 5) to approximately 20 GPM.

Table 3-9. Turbine Boost Pump Upper Impeller Test Conditions

Test Condition Number	Motive ΔP -PSID- (Set & Record)	Motive Flow -GPM- (Record)	Induced Flow -GPM- (Set & Record)	Boost ΔP -PSID- (Record)
1	79.4 - 80.4	69.3 Max	183.0 - 187.0	2.66 Min
2	79.4 - 80.4	69.3 Max	123.0 - 127.0	① 9.24 Min
3	79.4 - 80.4	69.3 Max	69.0 - 71.0	10.24 Min
4	79.4 - 80.4	69.3 Max	19.0 - 21.0	10.24 Min
5	39.4 - 40.0	48.8 Max	9.5 - 10.5	6.66 Min
6	39.4 - 40.0	48.8 Max	49.0 - 51.0	6.66 Max

NOTE: ① Applicable to Test Stand 74D460160-1001 only.

3-54. TURBINE TRANSFER PUMP - SEA LEVEL CALIBRATION TEST.

3-55. TEST SETUP.

1. Install the test unit and associated plumbing connections as specified in section 3-22 and figure 3-7.

a. Insure the UUT Tank plug is not installed as specified in section 3-26.

b. Establish initial control settings as addressed in section 3-25.

c. Establish power-up status as described in section 3-24.

2. Fill the UUT Tank (per section 3-26) four (4) to eight (8) inches above the pump inlet (yellow zone of the UUT Tank fluid indicator scale).

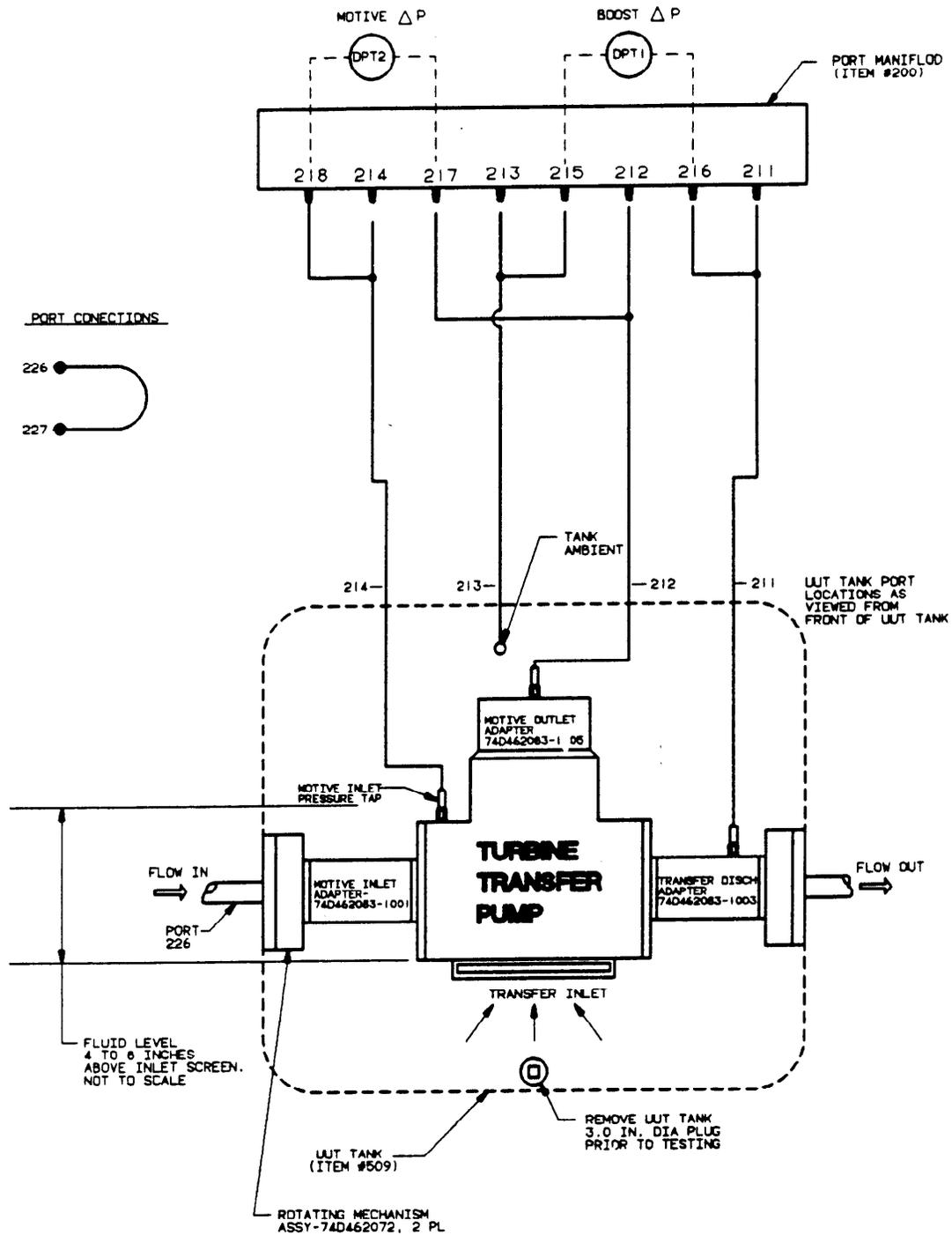
3. Set the recirculation pump to the RUN mode as described in section 3-27.

4. Start the inlet boost pump as described in section 3-29. Allow the system to operate for twenty seconds to purge the system of air.

5. Maintain the inlet fluid temperature between 70 to 90 degrees F. Adjust inlet temperature with temp controllers 411 and 412 if required.

3-56. TEST CONDITIONS.

3-57. A test data record sheet is provided in table 3-10. The actual column is where data will be recorded. If required, make a copy of the test data record sheet before performing the test conditions. Refer to Technical Manual TBD when conducting TTP performance test.



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Figure 3-7. Turbine Transfer Pump Test Setup Schematic

Table 3-10. Turbine Transfer Pump Sea Level Calibration
Test Data Record Sheet

Test Condition Number	Parameter Description	Requirements			Units
		Minimum	Actual	Maximum	
1	Motive Pressure Drop	86.0		87.0	PSID
	Motive Flow			45.0	GPM
	Transfer Flow	188		192	GPM
	Transfer Pressure Rise	5.3			PSID
	Temperature (Fluid)	70		90	°F
2	Motive Pressure Drop	86.0		87.0	PSID
	Motive Flow			45.0	GPM
	Transfer Flow	148		152	GPM
	Transfer Pressure Rise	5.3			PSID
	Temperature (Fluid)	70		90	°F
3	Motive Pressure Drop	86.0		87.0	PSID
	Motive Flow			45.0	GPM
	Transfer Flow	79.0		81.0	GPM
	Transfer Pressure Rise	5.3			PSID
	Temperature (Fluid)	70		90	°F
4	Motive Pressure Drop	86.0		87.0	PSID
	Motive Flow			45.0	GPM
	Transfer Flow	19.0		21.0	GPM
	Transfer Pressure Rise	5.3			PSID
	Temperature (Fluid)	70		90	°F
5	Motive Pressure Drop	44.5		45.5	PSID
	Motive Flow			33.0	GPM
	Transfer Flow	19.0		21.0	GPM
	Transfer Pressure Rise	3.85			PSID
	Temperature (Fluid)	70		90	°F
6	Motive Pressure Drop	44.5		45.5	PSID
	Motive Flow			33.0	GPM
	Transfer Flow	84.0		86.0	GPM
	Transfer Pressure Rise	3.85			PSID
	Temperature (Fluid)	70		90	°F

Serial Number : _____
 Date : _____
 Operator : _____
 Inspector : _____
 Disposition : _____

Table 3-11. Turbine Transfer Pump Test Conditions

Test Condition Number	Motive P -PSID- (Set & Record)	Motive Flow -GPM- Maximum (Record)	Transfer Flow -GPM- Maximum (Set & Record)	Transfer P -PSID- (Record)
1	86.0 - 87.0	45.0	190±2	5.3
2	86.0 - 87.0	45.0	150±2	5.3
3	86.0 - 87.0	45.0	80±1	5.3
4	86.0 - 87.0	45.0	20±1	5.3
5	44.5 - 45.5	33.0	20±1	3.85
6	44.5 - 45.5	33.0	80±1	3.85

3-58. Conduct the TTP Sea Level Calibration Test as follows:

1. Calibrate the test unit per table 3-11 and record the test data (if required) in table 3-10.
2. Use control 4 (TURBINE INLET PRESS/FLOW) to adjust the motive pressure drop.
3. Use control 5 (TURBINE OUTLET PRESS/FLOW) to adjust the transfer flow (Wt).

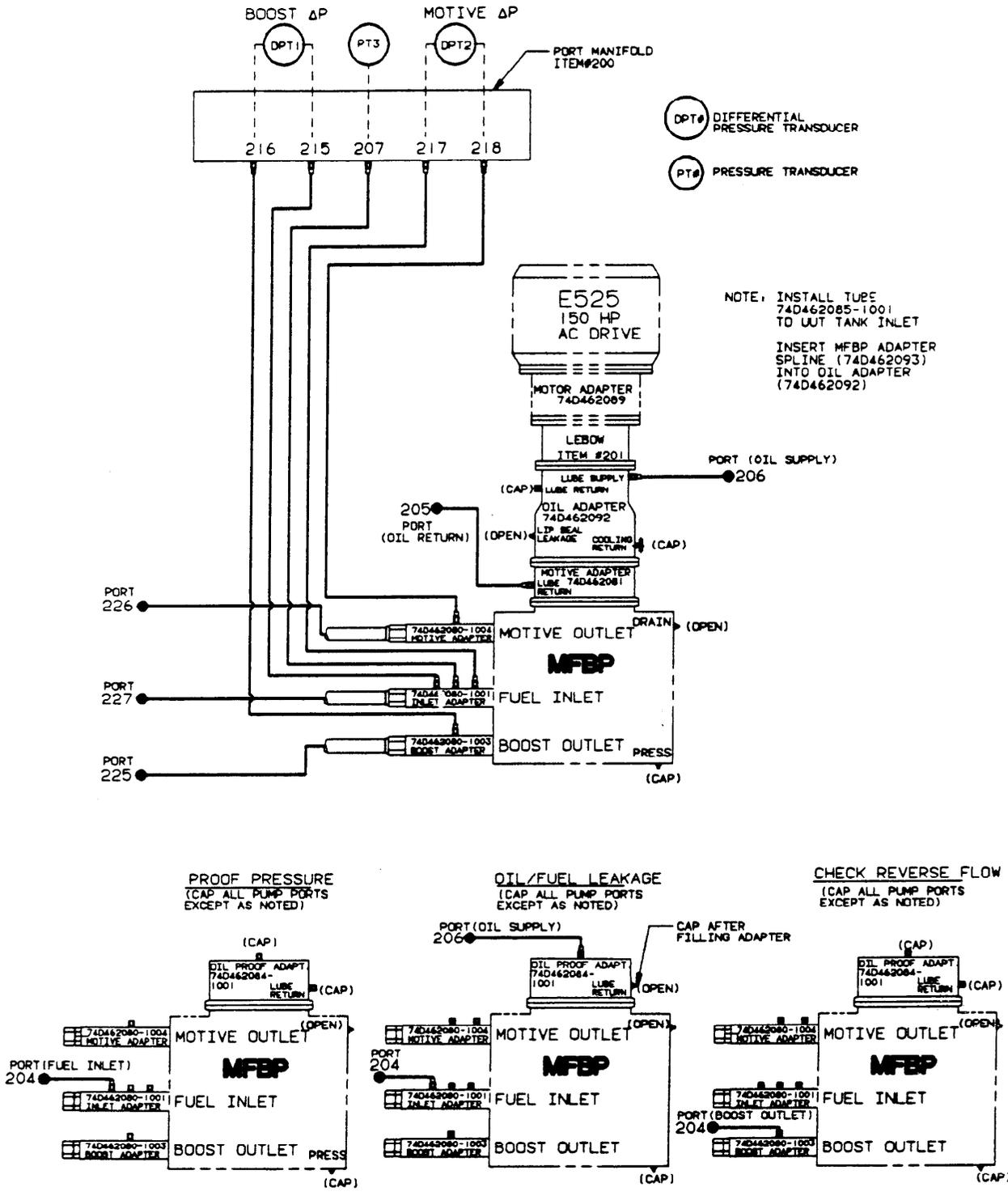
NOTE

To purge the system and pump of air, momentarily set control 4 to the first test condition pressure (86 PSID) and reduce the induced flow (with control 5) to approximately 20 GPM.

3-59. MOTIVE FLOW BOOST PUMP - SEA LEVEL CALIBRATION TEST.

3-60. TEST SETUP.

1. Install the test unit and associated plumbing connections as specified in sections 3-22, 3-23 and figure 3-8.
 - a. Insure the UUT Tank plug is not installed as specified in section 3-26.
 - b. Establish initial control settings as addressed in section 3-25.
 - c. Establish power-up status as described in section 3-24.
2. Fill the UUT Tank (per section 3-26) approximately one-half full.



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Figure 3-8. Motive Flow Boost Pump Test Setup Schematic

3. Set the recirculation pump to the RUN mode as described in section 3-27.
4. Start the inlet boost pump as described in section 3-29. Allow the system to operate for twenty seconds to purge the system of air.
5. Use control 6 (BOOST INLET REGULATOR) to set and maintain the MFBP inlet pressure to 10 +/- 0.5 PSIG throughout the test.

NOTE

Control 6 will require readjustment after the RPM is increased.

6. Start the lube pump as described in section 3-30. Use control 21 to set and maintain the lube flow to 0.25 +/- 0.05 GPM throughout the test.
7. Start the A/C drive as described in section 3-31.
8. Maintain the inlet fluid temperature between 75 +/- 10 degrees F. Adjust inlet temperature with temp controllers 411 and 412 if required.

3-61. TEST CONDITIONS.

3-62. Typical test data record sheets are provided in table 3-12. The actual column is where data will be recorded. If required, make a copy of the test data record sheets before performing the test conditions. Refer to Technical Manual A1-478AC-460-000 when conducting MFBP performance test.

3-63. Conduct the MFBP Sea Level Calibration Test as follows:

1. Calibrate the test unit per table 3-13 and record the test data (if required) in table 3-12.
2. Control each test condition's pressures and flows with the following control valves.
3. Use control 4 (TURBINE INLET PRESS/FLOW) to adjust the motive flow (Wmd).
4. Use control 6 (BOOST INLET REGULATOR) to adjust the MFBP inlet pressure (10 +/- 0.5 PSIG throughout the entire test).
5. Use control 10 (AB DISCHARGE FLOW ADJUST) to adjust the boost discharge high flow (Wbd (high flow)) during all test conditions except condition 3, table 2 of NAVAIR Technical Manual A1-478AC-460-000.
6. Use control 14 (LOW MFBP FLOW ADJUST) to adjust the boost discharge low flow (Wbd (low flow)) during test condition 3.
 - a. Record flow from boost discharge (Wbd) low flow display on the CRT screen.
 - b. After test completion, close control 14 prior to increasing flow.

Table 3-12. Motive Flow Boost Pump Sea Level Calibration
Test Data Record Sheet

Test Condition Number	Parameter Description	Requirements			① Units
		Minimum	Actual	Maximum	
1	5600 RPM:				
	24,240±240 PPH Motive, 0 PPH Boost Flow				
	Boost Pressure Rise	6.6	_____	20.0	PSID
	Motive Pressure Rise	43.0	_____	62.8	PSID
	Torque	_____	_____	92	IN LB
2	5600 RPM:				
	33,935±335 PPH Motive, 0 PPH Boost Flow				
	Boost Pressure Rise	7.0	_____	21.0	PSID
	Motive Pressure Rise	43.0	_____	62.8	PSID
	Torque	_____	_____	92	IN LB
3	5600 RPM:				
	33,935±335 PPH Motive, ② 1,034±34 PPH Boost Flow				
	Boost Pressure Rise	7.0	_____	21.0	PSID
	Motive Pressure Rise	43.0	_____	62.8	PSID
	Torque	_____	_____	92	IN LB
4	8000 RPM:				
	30,300±300 PPH Motive, 0 PPH Boost Flow				
	Boost Pressure Rise	30.0	_____	38.0	PSID
	Motive Pressure Rise	110.0	_____	122.0	PSID
	Torque	_____	_____	142.0	IN LB
5	8000 RPM:				
	30,300±300 PPH Motive, 20,200±200 Boost Flow				
	Boost Pressure Rise	20.0	_____	40.0	PSID
	Motive Pressure Rise	83.0	_____	130.0	PSID
	Torque	_____	_____	142.0	IN LB
6	8000 RPM:				
	48,480±480 PPH Motive, 0 PPH Boost Flow				
	Boost Pressure Rise	20.0	_____	40.0	PSID
	Motive Pressure Rise	83.0	_____	130.0	PSID
	Torque	_____	_____	142.0	IN LB

NOTES: ① Correct for MFBP adapter torque as described in section 3-35.

② Use control 14 to adjust flow. After test completion, close 14 prior to increasing flow.

Table 3-12. Motive Flow Boost Pump Sea Level Calibration
Test Data Record Sheet (Continued)

Test Condition Number	Parameter Description	Requirements			Units
		Minimum	Actual	Maximum	
7	8000 RPM:				
	48,480±480 PPH Motive,				
	5,020±60 PPH Boost Flow				
	Boost Pressure Rise	20.0	_____	40.0	PSID
8	8000 RPM:				
	48,480±480 PPH Motive,				
	20,200±200 PPH Boost Flow				
	Boost Pressure Rise	20.0	_____	40.0	PSID
9	8000 RPM:				
	48,480±480 PPH Motive,				
	40,400±400 PPH Boost Flow				
	Boost Pressure Rise	18.0	_____	40.0	PSID
	Motive Pressure Rise	83.0	_____	130.0	PSID
	Torque	_____	_____	142.0	IN LB
	Motive Pressure Rise	83.0	_____	130.0	PSID
	Torque	_____	_____	142.0	IN LB
	Motive Pressure Rise	90.0	_____	130.0	PSID
	Torque	_____	_____	142.0	IN LB

MOTIVE FLOW BOOST PUMP DRIVE ADAPTER TORQUE TEST DATA SHEET

Adapter torque at 5,600 RPM _____ IN LB
 Adapter torque at 8,000 RPM _____ IN LB

Serial Number : _____
 Date : _____
 Operator : _____
 Inspector : _____
 Disposition : _____

Table 3-13. Motive Flow Boost Pump Test Conditions

Pump Speed RPM 20	Boost Flow PPH	Boost Discharge Pressure PSID Min. - Max.	Motive Flow PPH	Motive Discharge Pressure PSID Min. - Max.	① Input Torque In - Lb Maximum
5600	-0-	6.6 - 20.0	24240±240	43.0 - 62.8	92
5600	-0-	7.0 - 21.0	33935±335	43.0 - 62.8	92
5600 ②	1034±34	7.0 - 21.0	33935±335	43.0 - 62.8	92
8000	-0-	30.0 - 38.0	30300±300	110.0 - 122.0	142
8000	20200±200	20.0 - 40.0	30300±300	83.0 - 130.0	142
8000	-0-	20.0 - 40.0	48480±480	83.0 - 130.0	142
8000	5020±60	20.0 - 40.0	48480±480	83.0 - 130.0	142
8000	20200±200	20.0 - 40.0	48480±480	83.0 - 130.0	142
8000	40400±400	18.0 - 40.0	48480±480	90.0 - 130.0	142

NOTE: ① Correct for MFBP adapter torque as described in section 3-35.

② Use control 14 to adjust flow. After test completion, close 14 prior to increasing flow.

c. Do not flow greater than 15 GPM through the flowmeter.

3-64. MOTIVE FLOW BOOST PUMP - PROOF PRESSURE, LEAKAGE, AND CHECK VALUE REVERSE FLOW TESTS.

3-65. TEST SETUP.

1. Install the test unit and associated plumbing connections as specified in sections 3-22, 3-23 and figure 3-8.

a. Establish initial control settings as shown below.

13 PROOF PRESSURE REGULATOR	fully closed
18 PROOF PRESSURE SHUTOFF	fully closed
19 PROOF PRESSURE BLEED	fully closed
21 OIL SUPPLY SHUTOFF	fully closed

2. Set the recirculation pump to the RUN mode as described in section 3-27.
3. Pull the proof pressure pump button (E39) to start the proof pump.
4. Open control 18 (PROOF PRESSURE SHUTOFF) fully.

3-66. TEST CONDITIONS.

3-67. Control each test condition's fuel and oil proof pressures with the following control valves.

1. Use control 13 (PROOF PRESSURE REGULATOR) to adjust the fuel proof pressure.
2. Use control 19 to bleed the fuel proof pressure from the system after the proof pressure pump is turned off.
3. Use control 21 (OIL SUPPLY SHUTOFF) to adjust the oil proof pressure.

3-68. REMOVING THE TEST PUMPS.

1. Rotate SPEED CONTROL potentiometer (Item E35) counterclockwise to zero position.
2. Push in (off) AC DRIVE switch (Item E34).
3. Push in (off) LUBE OIL PUMP circuit breaker (Item E36).
4. Push in (off) BOOST PUMP circuit breaker (Item E38).
5. Drain the UUT Tank (Item 509) as specified in section 3-28.
6. Disconnect all hoses, adapters and mounting fixtures directly attached to the pump. Loosen the accessory drive coupling clamp, and pull pump from drive spline.

3-69. SHUTTING DOWN THE TEST STAND.

1. Rotate SPEED CONTROL potentiometer (Item E35) counterclockwise to zero position.
2. Push in (off) AC DRIVE switch (Item E34).
3. Push in (off) LUBE OIL PUMP circuit breaker (Item E36).
4. Push in (off) BOOST PUMP circuit breaker (Item E38).
5. Push in (off) RECIRC PUMP circuit breaker (Item E37) or drain the UUT Tank (Item 509) as specified in section 3-28.
6. On the remote Electrical Power Unit rotate two (2) Power switches to OFF.
7. Shutoff shop air and water to the Test Stand.

3-70. EMERGENCY SHUT DOWN OF THE TEST STAND.

1. Two PUSH FOR EMERGENCY STOP valves (Items 23, 25) are provided on the front panel which will immediately shut down the Test Stand when depressed. An additional EMERGENCY STOP switch is provided on the front of the remote Electrical Power Unit.

SECTION IV
MAINTENANCE INSTRUCTIONS

4-1. GENERAL. Periodic visual and operational checks and minor adjustments are essential for proper performance of the Test Stand.

4-2. PERIODIC INSPECTIONS.

WARNING

Prior to operation, inspect all components and accessories for visible signs of damage that may cause improper operation or result in a possible explosion if the faulty device is operated in a hazardous atmosphere in which the Test Stand must function.

4-3. DAILY INSPECTION. Perform the following inspection prior to operation:

CAUTION

A minimum of 3/4 level of test fluid shall be maintained in the reservoir, since operation of the Test Stand with insufficient fluid will cause the Test Stand pumps to be inoperative, and may cause irreparable damage to the motor-driven boost pump which depends on test fluid being pumped for its internal lubrication.

1. Check level of fuel (MIL-C-7024 Type II) reservoir (Item 500). The fluid level must be at a minimum of 3/4 on fluid level indicator (Item 574).
2. Check lube system (Item 560) oil level gauge (Item 576). The oil reservoir should be full prior to start up of Test Stand.
3. Open drain cock at bottom of air filter (Item 565), drain moisture, and close drain cock.

4-4. With Test Stand operating, monitor air pressure to mist lubricator (Item 581) of A/C Drive on gauge (Item 409) at rear panel. Adjust regulator (Item 406) at rear panel to achieve 6 PSIG of regulated air pressure.

NOTE

Oil level shall always be visible in sight gauge.

Verify the mist lubricator (Item 581) is dripping at a constant rate of approximately 60 drops per minute.

4-5. WEEKLY INSPECTION. Perform the following inspection with the Test Stand operating:

WARNING

Prior to operating the Test Stand purge all hazardous vapors from Test Stand before removal of covers of any of the explosion-proof enclosures.

1. Open doors on rear and sides of Test Stand and observe for dripping wet spots in fuel lines or evidence of air leakage in air lines. Tighten or replace leaking joints.
2. Observe bonnets on valves for leakage, tighten packing nut or replace packing.
3. Observe that applicable indicating lights are on, replace defective bulbs after turning off Test Stand power.
4. Inspect all hoses for cuts, abrasions and deterioration. Replace damaged or worn hoses with hoses of the same size, length material and pressure rating.
5. During Test Stand operation, observe differential pressure gauges (Items 401, 402, 403, 404) for high pressure drop across fuel filters (Items 505, 535, 520, 544). Replace filter elements as necessary at an indicated differential pressure (see paragraph 4-7).
6. Observe temperature controller indicators (Items 411, 412) for stabilization and control point, reset as necessary.
7. Observe instrument air gauges (Items 617 and 407) for 20 ± 2 PSIG setting, and instrument air gauges (Items 603 and 604) for 50 +5, -0 PSIG setting, reset as necessary.
8. Observe oil mist gauge (Item 409) for 6 PSIG setting, reset as necessary.
9. With main electrical power circuit switch at off, inspect all electrical connections and contacts for security of attachment and evidence of arcing. Clean contacts and tighten connections where necessary.
10. Inspect, clean or replace air shop filter (Item 565) element (see paragraph 4-9).

4-6. MONTHLY INSPECTION. Perform monthly inspection as follows:

1. Inspect for damage, deterioration of paint or finishes; loose, missing, or illegible markings or warning plates.
2. Inspect switches and circuit breakers for ease of operation and security. Inspect all components for security. Inspect markings for legibility and security.
3. Inspect elements of strainers (Items 502, 549, 554), and clean or replace as required.

5. Every six months, observe air purge chamber filter (Item 552), and clean or replace.

4-7. FUEL FILTER CHANGE/CLEANING. For fuel filters (Items 505, 520, 535, 544).

4-8. When differential pressure on gauges (Items 401, 404, 402) indicates 10 PSID, and or gauge (Item 403) indicates 15 PSID, proceed as follows:

1. Turn Test Stand power off.
2. Open filter drain plug, and drain completely.
3. When pressure gauge (of perspective filter) reads zero, open filter cover vent valve.

CAUTION

Be sure pressure in filter is at zero before loosening cover.

4. Loosen cover bolts and remove cover.
5. Remove and discard cover seal/gasket.
6. Remove separate cartridge hold-down cap or relief-valve assembly on top of each cartridge stack if used. Do not discard.
7. Remove cartridge or cartridge adapter assemblies from filter casing.
8. Install new or replaced filter cartridges in filter casing. (See manufacturer's Literature Data Sheet for replacement type and instructions.)
9. After cartridge or cartridge adapter assemblies have been installed in filter, replace hold-down cap or relief-valve assembly on top of each cartridge stack.
10. Clean cover sealing surfaces as required and inspect for nicks and scratches. Put new cover seal/gasket in place.
11. Carefully close cover, and tighten bolts to recommended torque values. Refer to values below for proper torquing.

CAUTION

- "R" Series Filters manufactured before February 14, 1977 and rated 80 PSI working pressure should be torqued to 85 ft.-lbs. maximum. Overtorquing will result in deformation of the cover and possible seal leakage.
- "R" Series Filters manufactured after this date and rated 100 PSI working pressure have a redesigned cover and should be torqued to 120 ft.-lbs.

Bolt Size	Torque to: Ft.- Lb.
5/8 Inch	90
3/4 Inch	150
7/8 Inch	240
1 Inch	370
1 1/8 Inches	560

12. Close drain plugs and vent valves.

4-9. For air filter (Item 565). On a scheduled basis, replace the element as follows:

1. Turn Test Stand power off.
2. Remove the filter bowl. Remove element and discard. Clean bowl.
3. Install new element into bowl and install bowl to filter head.

4-10. LUBRICATION. Refer to table 4-1 for Lubrication Schedule.

CAUTION

Do not over-lubricate motors.

Table 4-1. Lubrication Schedule.

Equipment Item	Lubricant	Frequency	Procedure
Drive Motor (Item E525)	Oil Mist Lub. Sys. (Item 560) Mobil Mist No. 24 or equiv. (100 SSU @ 100°F)	As Required	Refill oil reservoir to full mark.
Recirc. Pump Motor (Item 503)	MIL-L-7711 or equiv.	800 hours	Pressure grease fittings each end.
Proof Pump Motor (Item 512)	MIL-L-7711 or equiv.	800 hours	Pressure grease fittings each end.

NOTE: Motors that are not listed have sealed bearings which are self-lubricated.

SECTION V
CALIBRATION

5-1. GENERAL. The precision instruments incorporated in the Test Stand have a high degree of accuracy for long periods of time under normal usage. However, it is recommended that they be checked periodically and recalibrated whenever necessary.

5-2. Calibration as given in table 5-1, should be performed by a qualified instrument technician by reference to secondary calibration standards.

5-3. For calibration of the Daytronics System with respect to the pressure transducers, flowmeters, RTDs, and torque sensor, refer to Section 1.G, "Calibration of Data Channels (Part No. 92009, version SB.2)" of Daytronics 10K6 Technical Manual.

Table 5-1. Calibration Summary

Instrument	Calibration Method	Instrument Accuracy	Frequency of Calibration
Pressure Transducers (Items E504, E508, E509, E515, E517, E518, E520, E522)	Pneumatic Tester	+/- 1/4% F.S.	Six Months
Pressure Transducers (Item E506)	Dead Weight Tester	+/- 1/4% F.S.	Six Months
Flowmeters (Items E570-E580)	Frequency Simulation (Sine Wave +/- .1db, 50 ohm)	+/- .0000005 hz	Six Months
RTDs (Items E501, E505, E511, E514, E516, E539, E590, E592-E595)	Immersion Method using Master Thermometer	+/- 0.5°F	Six Months
Torque Sensor (Item E201)	Dead Weight Tester	+/- 1 Lb In	Six Months
Gauge (Item 1) Range 0-60 PSI	Dead Weight Tester	+/- 1/4% F.S.	Six Months

Table 5-1. Calibration Summary (Continued)

Instrument	Calibration Method	Instrument Accuracy	Frequency of Calibration
Gauge (Item 2) Range 0-300 PSI	Dead Weight Tester	+/- 1/4% F.S.	Six Months
Gauge (Item 3) Range 0-2000 PSI	Dead Weight Tester	+/- 1/4% F.S.	Six Months
Pressure Switches (Items E513, E519, E524, E527, E528, E529, E530, E533, E568, E587, E598)	Pneumatic Tester	+/- 1/4% F.S.	Six Months
Pressure/Temperature Switches (E526)	Pneumatic Tester and Immersion Method using Master Thermometer and Micromite Frequency Converter	+/- 1/4% F.S. +/- 1°F	Six Months
Temperature Switches (E502, E512)	Immersion Method using Master Thermometer and Micromite Frequency Converter.	+/- 1°F	Six Months

SECTION VI

REPAIR INSTRUCTIONS

6-1. GENERAL. All components used in the Test Stand are constructed of quality materials that the anticipated life is such that no repairs should be required for the life of the Test Stand.

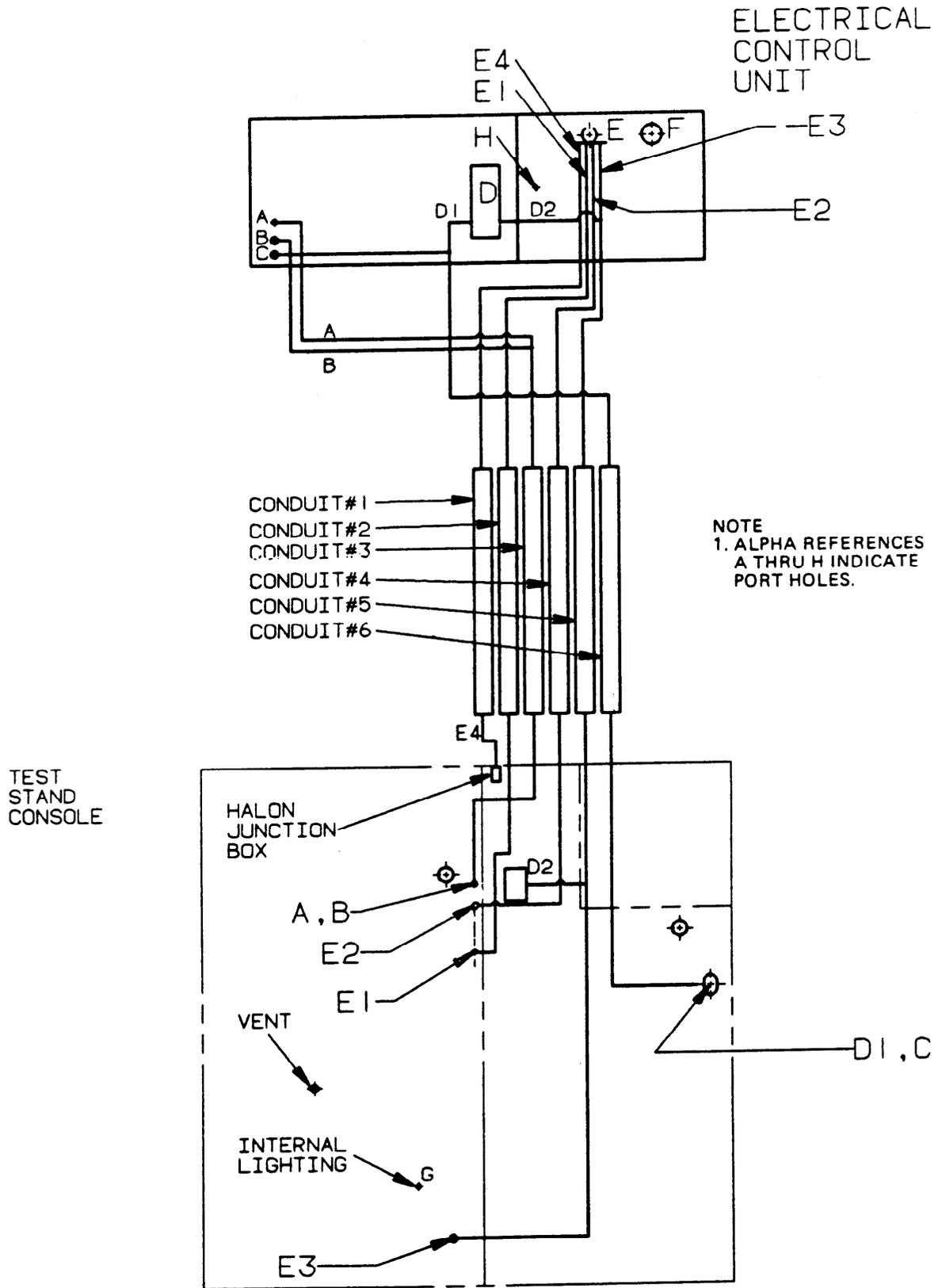
6-2. Should the situation arise where the Test Stand must be modified or changed, and components removed, standard shop tools may be used for disconnecting any fluid lines, conduit or wiring. After all connections have been removed, the mounting bolts or screws can be withdrawn and the component removed.

6-3. For further information on checking, repairing or replacing parts of the Test Stand major components, see the manufacturer's components literature and parts list data on the part concerned.

SECTION VII
INTERCONNECTION WIRING LIST

7-1. GENERAL. This section provides interconnection electrical wiring data between facility, Electrical Power Unit and the Test Stand Console Unit. The wires are labeled at each termination with the same number as designated on the electrical schematic.

7-2. The conduits terminate at the Electrical Power Unit junction boxes and at the top rear of the Test Stand in a main junction box. Figure 7-1 and the following pages contain conduit/wiring port identification, routing and size.



74D462067-7

Figure 7-1. Conduit Routing and Electrical Connections

CONDUIT IDENTIFICATION - NO. 1 (PORT E4)

Electrical Controller Terminal	Connect to, or Equipment Description	Test Stand Terminal	Wire Number	Wire Size
	Halon System		9 Wires	#16 AWG

CONDUIT IDENTIFICATION - NO. 2 (PORT E1)

Electrical Controller Terminal	Connect to, or Equipment Description	Test Stand Terminal	Wire Number	Wire Size
	115VAC 60 HZ to Pressure Switches		9	#14 AWG
	Air Supply E528 and Purge Air Control E529		10	#14 AWG

CONDUIT IDENTIFICATION - NO. 3 (PORT A, B)

Electrical Controller Terminal	Connect to, or Equipment Description	Test Stand Terminal	Wire Number	Wire Size
32 (on TBC-DC)	AC 150 HP Motor E525 RPM Pick-up	32	32	#20 AWG (shielded)
33 (on TBC-DC)	AC 150 HP Motor E525 RPM Pick-up	33	33	#20 AWG (shielded)
on TBC-DC	AC 150 HP motor E525 RPM pick-up	31	Shield	Shielded cable
40 (on TBC-DC)	Speed Control E35	40		#14 AWG (Shielded)
41 (on TBC-DC)	Speed Control E35	41		#14 AWG (Shielded)
42 (on TBC-DC)	Speed Control E35	42		#14 AWG (Shielded)

Interconnection Wiring List (Sheet 1 of 5)

CONDUIT IDENTIFICATION - NO. 4 (PORT E2)

Electrical Controller Terminal	Connect to, or Equipment Description	Test Stand Terminal	Wire Number	Wire Size
1	115 VAC 60 HZ	1	1	#16 AWG
X1	115 VAC 60 HZ	X1	X1	#16 AWG
3 (on TBX)	115 VAC 60 HZ	3	3	#16 AWG
4 (on TBX)	115 VAC 60 HZ	4	4	#16 AWG
5 (on TBX)	115 VAC 60 HZ	5	5	#16 AWG
6 (on TBX)	115 VAC 60 HZ	6	6	#16 AWG
13 (on TBC-AC)	115 VAC 60 HZ	13	13	#16 AWG
013	115 VAC 60 HZ	013	013	#16 AWG
14 (on TBC-AC)	115 VAC 60 HZ	14	14	#16 AWG
014	115 VAC 60 HZ	014	014	#16 AWG
15 (on TBC-AC)	115 VAC 60 HZ	15	15	#16 AWG
015	115 VAC 60 HZ	015	015	#16 AWG
16 (on TBX)	115 VAC 60 HZ	16	16	#16 AWG
016	115 VAC 60 HZ	016	016	#16 AWG

Interconnection Wiring List (Sheet 2 of 5)

CONDUIT IDENTIFICATION - NO. 4 (PORT E2)
(Continued)

Electrical Controller Terminal	Connect to, or Equipment Description	Test Stand Terminal	Wire Number	Wire Size
017	115 VAC 60 HZ	017	017	#14 AWG
018	115 VAC 60 HZ	018	018	#14 AWG
019	115 VAC 60 HZ	019	019	#14 AWG
020	115 VAC 60 HZ	020	020	#14 AWG
66	Recirculation Starter E523	66	66	#14 AWG
67	Inlet Press. Starter E532	67	67	#14 AWG
70	Proof Press. Starter E531	70	70	#14 AWG
71	Lube Pump Starter E535	71	71	#14 AWG
72	Drive Blower Starter E583	72	72	#14 AWG
76	Spare	76	Spare	
77	Spare	77	Spare	

Interconnection Wiring List (Sheet 3 of 5)

CONDUIT IDENTIFICATION - NO. 5 (PORT D2, E3)

Electrical Controller Terminal	Connect to, or Equipment Description	Test Stand Terminal	Wire Number	Wire Size
1L1	440 VAC 60 HZ	1T1	1T1	#14 AWG
1L2	to Recirculation	1T2	1T2	#14 AWG
1L3	Pump 503	1T3	1T3	#14 AWG
2L1	440 VAC 60 HZ	2T1	2T1	#8 AWG
2L2	to Inlet	2T2	2T2	#8 AWG
2L3	Boost Pump 512	2T3	2T3	#8 AWG
3L1	440 VAC 60 HZ	3T1	3T1	#14 AWG
3L2	to Proof	3T2	3T2	#14 AWG
3L3	Test Pump 555	3T3	3T3	#14 AWG
4L1	440 VAC 60 HZ	4T1	4T1	#14 AWG
4L2	to Lube	4T2	4T2	#14 AWG
4L3	Oil Pump 560	4T3	4T3	#14 AWG
5L1	440 VAC 60 HZ	5T1	5T1	#14 AWG
5L2	to Purge Blower	5T2	5T2	#14 AWG
5L3	Pump E582	5T3	5T3	#14 AWG
7L1	440 VAC 60 HZ	7T1	7T1	#14 AWG
7L2	to AC 150 HP	7T2	7T2	#14 AWG
7L3	Motor Blower E635	7T3	7T3	#14 AWG

CONDUIT IDENTIFICATION - NO. 6 (PORT C, D1)

Electrical Controller Terminal	Connect to, or Equipment Description	Test Stand Terminal	Wire Number	Wire Size
1T1	Var Voltage/	T1	T1	3/0
1T2	Var Freq to AC	T2	T2	3/0
1T3	150 HP Motor E525	T3	T3	3/0
	Chassis Ground			3/0
4 (on TBI-AC)	Thermo Switch on	P1	4	#14 AWG
5 (on TBI-AC)	AC 150 HP Motor E525	P2	5	#14 AWG
	440V Facility Power	Port F	440V Power Cable	3/0
Port G	115V Facility Power (Internal Lighting)		2 Wires	#14 AWG
	115V Facility Power (Halon System)	Port H	3 Wires	#14 AWG

Section VIII

TROUBLESHOOTING INSTRUCTIONS

8-1. GENERAL. Table 8-1 contains a list of conditions which could result in the Test Stand, pumps or the A/C motor not powering-on. When the Test Stand does not power-on properly, refer to table 8-1. Component and system line failures are not included herein due to their low probability of failure. Whenever a particular item is suspect of failure refer to the pertinent commercial literature for detailed instructions.

Table 8-1. Troubleshooting Instructions

PROBLEM/PROBABLE CAUSE	ISOLATION PROCEDURE	REMEDY
TEST STAND FAILS TO POWER-ON.		
Remote electrical power unit.	Check circuit breakers (CB-1, CB-2).	Place circuit breaker ON.
Low Shop Air (less than 80 PSIG).	Check pressure gage (Item 408) to verify pressure.	
Valve (Item 564) closed.	Check to see if valve is closed.	Open valve.
Valves PUSH FOR EMERGENCY STOP (Items 23, 25) pushed in.	Verify that valves are pushed in.	Pull valves out (open).
Facility air to Test Stand is below 80 PSIG.		Apply facility air above 80 PSIG.
Low Purge Pressure.	Check all purge enclosure panels.	Close any enclosure panel that is open.

NOTE

The Test Stand will not power-on until the purge chamber has been pressurized and shop air has been initiated for approximately two (2) minutes.

Table 8-1. Troubleshooting Instructions (Continued)

PROBLEM/PROBABLE CAUSE	ISOLATION PROCEDURE	REMEDY
<p>RECIRCULATION PUMP FAILS TO POWER-ON (Circuit breaker light RECIRC PUMP (Item E37) does not engage.) (Indicator light RECIRC PUMP INTERLOCK (Item E11) is off.)</p>		
<p>Low Water Pressure</p>	<p>Verify indicator light LOW WATER PRESS (Item E4) is on.</p>	
<p>Valve (Item 548) is closed.</p>	<p>Check to see if valve is closed.</p>	<p>Open valve.</p>
<p>Facility water (off/low).</p>	<p>Check facility water application.</p>	<p>Apply facility water.</p>
<p>Selector switch RECIRC PUMP MODE SELECT (Item E40) not engaged for FILL, DRAIN, or RUN mode.</p>	<p>Verify selector switch position.</p>	<p>Select FILL, DRAIN, or RUN mode.</p>
<p>Main reservoir (Item 500) fluid level is low (filling mode).</p>	<p>Verify indicator light RESERVOIR LOW LEVEL (Item E19) is on.</p>	<p>Fill the main reservoir with fluid.</p>
<p>UUT Tank door interlock (Item 574) is not engaged.</p>	<p>Verify indicator light DOOR INTERLOCK (Item E10) off. Check all latches around the door.</p>	<p>Secure all door latches.</p>
<p>Overtemperature of recirculation pump motor (Item 503).</p>	<p>Verify overtemperature condition of motor.</p>	<p>Refer to vendor material.</p>
<p>UUT Tank is at high level shutoff mode.</p>	<p>Verify indicator light TEST TANK HI LEVEL (Item E5) is on. Recirculation pump will not operate in the FILL mode only.</p>	<p>Drain UUT Tank below TEST TANK HI LEVEL (light, Item E5, will extinguish) or select RUN or DRAIN mode.</p>

Table 8-1. Troubleshooting Instructions (Continued)

PROBLEM/PROBABLE CAUSE	ISOLATION PROCEDURE	REMEDY
UUT Tank is at low level shutoff.	Verify indicator light TEST TANK LOW LEVEL (Item E12) is on. Recirculation pump will not operate in the DRAIN mode only.	Fill the UTT Tank (light, Item E12, extinguishes) or select FILL mode.
NOTE		
When low level is reached (indicated by light TEST TANK LOW LEVEL (Item E12) coming on), a twenty-five (25) second time delay will commence followed by the recirculation pump shutting down.		
INLET BOOST PUMP FAILS TO POWER-ON. (Circuit breaker light BOOST PUMP (Item E38 does not engage.)		
Recirculation pump is not on.		
Toggle switch INLET SHUTOFF (Item E29) energized (toggle up).	Verify indicator light INLET SHUTOFF (Item E21) is on.	Select toggle to de-energized position (toggle down).
Overtemperature of UUT Tank fluid (above 90 degrees F).		
Overtemperature of boost pump motor (Item 512).	Verify overtemperature condition of motor.	Refer to vendor material.
LUBE OIL PUMP FAILS TO POWER-ON. (Circuit breaker light LUBE OIL PUMP (Item E36) does not engage.)		
Lube oil fluid reservoir is low.	Verify indicator light LOW AC MOTOR OIL (Item E20) is on.	Fill the oil reservoir.
Low Water Pressure.	Verify indicator light LOW WATER PRESS (Item E4) is on.	

Table 8-1. Troubleshooting Instructions (Continued)

PROBLEM/PROBABLE CAUSE	ISOLATION PROCEDURE	REMEDY
Valve (Item 548) is closed.	Check to see if valve is closed.	Open valve.
Facility water to Test Stand is off.	Check facility water application.	Apply facility water.

NOTE

Power-on to lube pump activates the A/C drive mister (Item 581) and the A/C drive blower (Item 561).

PROOF PRESSURE PUMP FAILS TO POWER-ON. (Circuit breaker light PROOF PUMP (Item E39) does not engage.)

Main reservoir fluid level is low.

Verify indicator light RESERVOIR LOW LEVEL (Item E19) is on.

Fill the main reservoir with fluid.

Overtemperature of proof pressure pump motor (Item 555).

Verify overtemperature condition of motor.

Refer to vendor material.

A/C DRIVE MOTOR FAILS TO POWER-ON. (Switch light AC DRIVE (Item E34) does not engage.)

Inlet pressure (system line 227) is low.

Check to see if inlet boost pump is off.

Turn on inlet pump.

A/C drive pressure (from A/C drive blower) in low.

Check to see if A/C blower is off.

Refer to vendor material.

A/C drive mister pressure is low.

Oil lube pump is off; or pressure is low (below 5 PSIG).

Check to see if oil lube pump is off.

Turn on oil lube pump.

Oil lube temperature is high (above 90 degrees F).

Table 8-1. Troubleshooting Instructions (Continued)

PROBLEM/PROBABLE CAUSE	ISOLATION PROCEDURE	REMEDY
Bypass line pressure exceeds 175 PSIG.	Verify control setting.	Set control at zero.
A/C drive SPEED CONTROL (Item E35) is not set at zero.		
Inlet temperature is high.		
Any suspected failure in Data Acquisition System (DAS).	Refer to DAS User's Guide, Appendix 2.	

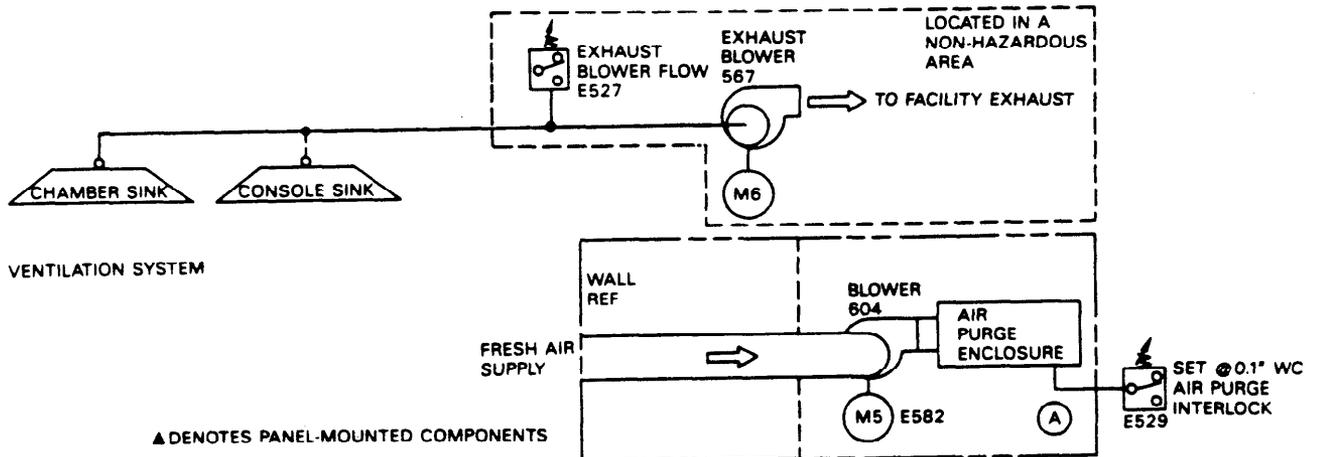
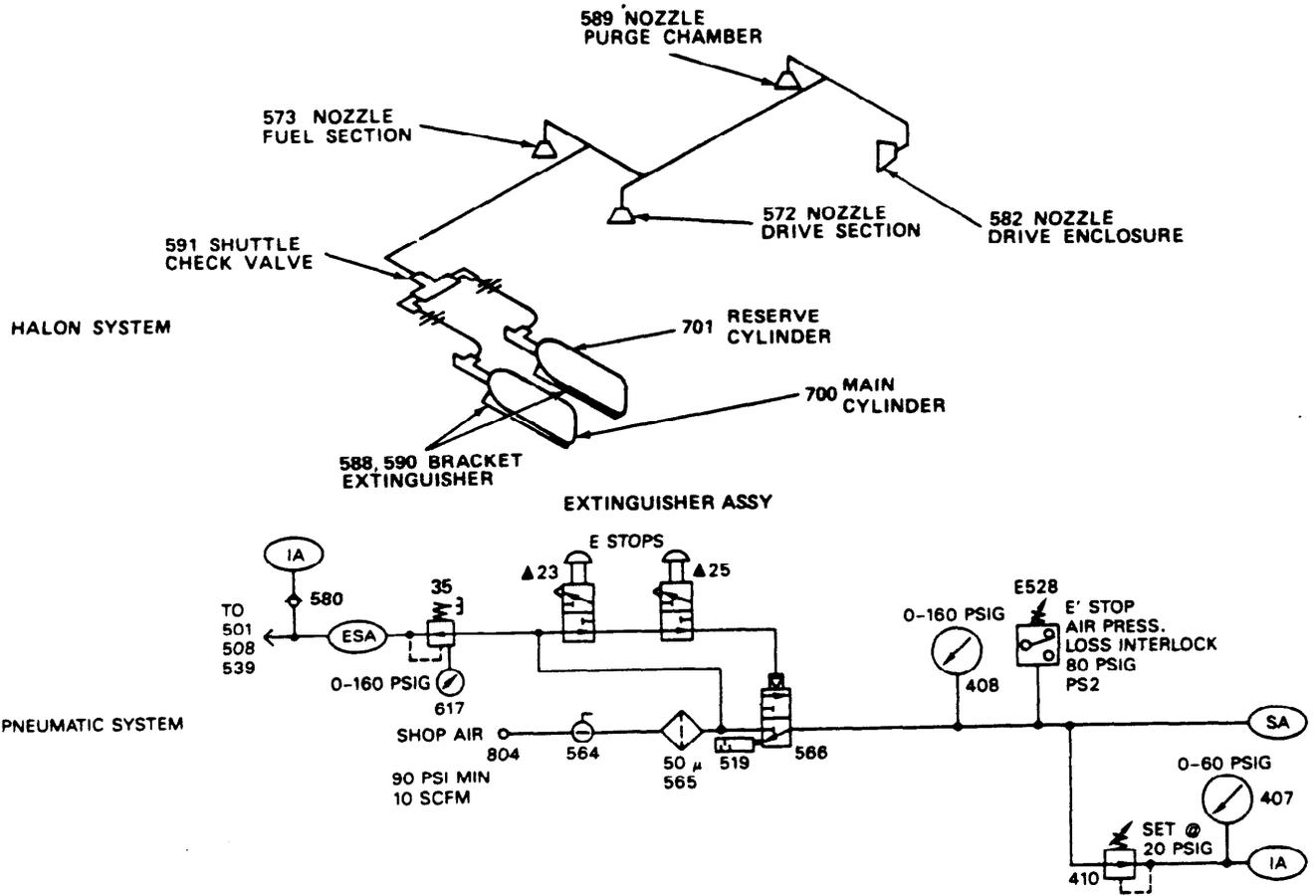
SECTION IX

DRAWINGS, SCHEMATIC DIAGRAMS AND PARTS LIST

9-1. GENERAL. This section contains drawings, schematic diagrams and a parts list comprising the Test Stand. The drawings and schematic diagrams are intended to assist maintenance personnel in locating components and tracing circuits when the Test Stand is malfunctioning. Included in the parts list is the manufacturer's name. The manufacturer's address, and/or FSCM number is referenced in the Vendors Material and Manuals Section.

NOTE

The missing sequence item numbers are not used.



NOTES:
1. SEE SEPARATE PARTS LIST

74D462069-2

Fuel Pump Test Stand - Hydraulic Schematic (Sheet 2 of 2)

FUEL PUMP TEST STAND (P/N 74D460160-1001) PARTS LIST

ITEM NO.	PART NUMBER MANUFACTURER	DESCRIPTION	QTY	DRAWING/ SCHEMATIC DIAGRAM NO.
E001	10VCM12 DAYTRONICS	MONITOR, SYSTEM 10	1	74D462067 74D462068
E002	65061K-206 SWITCHCRAFT, INC.	SWITCH, SELECTOR, 6 POS, 125V WPDT CONTACTS RATED AT 3 AMPS, 125V PUSH BUTTON TYPE WITH LOCK OUT, SOLDER TERMINALS	1	74D462067
E003	1050C1 INDUSTRIAL DEVICES	LIGHT, PILOT, MIDGET RED, LENS 110 VOLTS, 50/60 HZ GREEN LENS MIDGET SERIES	1	74D462067 74D462068
E004	1050C1 INDUSTRIAL DEVICES	LIGHT, PILOT, MIDGET RED, LENS 110 VOLTS, 50/60 HZ GREEN LENS MIDGET SERIES	1	74D462067 74D462068
E005	1050C1 INDUSTRIAL DEVICES	LIGHT, PILOT, MIDGET RED, 110 VOLTS, 50/60 HZ, RED LENS, MIDGET SERIES	1	74D462067 74D462068
E006	PTW2216-N00 MICRO SWITCH	LIGHT, PILOT, GREEN, 1/2" DIA. 120V, 110/120 VAC, 50/60 HZ, INCLUDES 27/32"X1-7/8" BLANK ALUM LEGEND PLATE, 11/16" DIA MTG HOLE, USES REPLACEMENT LAMP T-1 3/4 #328	1	74D462067 74D462068
E007	PTW2216-N00 MICRO SWITCH	LIGHT, PILOT, GREEN, 1/2" DIA. 120V, 110/120 VAC, 50/60 HZ, INCLUDES 27/32"X1-7/8" BLANK ALUM LEGEND PLATE, 11/16" DIA MTG HOLE, USES REPLACEMENT LAMP T-1 3/4 #328	1	74D462067 74D462068
E008	PTW2216-N00 MICRO SWITCH	LIGHT, PILOT, GREEN, 1/2" DIA. 120V, 110/120 VAC, 50/60 HZ, INCLUDES 27/32"X1-7/8" BLANK ALUM LEGEND PLATE, 11/16" DIA MTG HOLE, USES REPLACEMENT LAMP T-1 3/4 #328	1	74D462067 74D462068
E009	PTW2216-N00 MICRO SWITCH	LIGHT, PILOT, GREEN, 1/2" DIA. 120V, 110/120 VAC, 50/60 HZ, INCLUDES 27/32"X1-7/8" BLANK ALUM LEGEND PLATE, 11/16" DIA MTG HOLE, USES REPLACEMENT LAMP T-1 3/4 #328	1	74D462067 74D462068

FUEL PUMP TEST STAND (P/N 74D460160-1001) PARTS LIST

ITEM NO.	PART NUMBER MANUFACTURER	DESCRIPTION	QTY	DRAWING/ SCHEMATIC DIAGRAM NO.
E010	1052C5 INDUSTRIAL DEVICES	LIGHT, PILOT, MIDGET GREEN, LENS, 110 VOLTS, 50/60 HZ GREEN LENS MIDGET SERIES	1	74D462067 74D462068
E011	1052C5 INDUSTRIAL DEVICES	LIGHT, PILOT, MIDGET GREEN, LENS, 110 VOLTS, 50/60 HZ GREEN LENS MIDGET SERIES	1	74D462067 74D462068
E012	1050C1 INDUSTRIAL DEVICES	LIGHT, PILOT, MIDGET RED, 110 VOLTS, 50/60 HZ, RED LENS, MIDGET SERIES	1	74D462068
E013	3190-0001 MCGILL MANUF. CO	SWITCH, TOGGLE, SPST, 1/4 HP PANEL MOUNTING WITH 15/32" DIA MOUNTING BUSHING, 6 AMPS AT 125 VAC, 3 AMPS AT 250 VAC, SCREW TERM.	1	74D462067 74D462068
E014	3190-0001 MCGILL MANUF. CO	SWITCH, TOGGLE, SPST, 1/4 HP PANEL MOUNTING WITH 15/32" DIA MOUNTING BUSHING, 6 AMPS AT 125 VAC, 3 AMPS AT 250 VAC, SCREW TERM.	1	74D462067 74D462068
E015	3190-0001 MCGILL MANUF. CO	SWITCH, TOGGLE, SPST, 1/4 HP PANEL MOUNTING WITH 15/32" DIA MOUNTING BUSHING, 6 AMPS AT 125 VAC, 3 AMPS AT 250 VAC, SCREW TERM.	1	74D462067 74D462068
E016	3190-0001 MCGILL MANUF. CO	SWITCH, TOGGLE, SPST, 1/4 HP PANEL MOUNTING WITH 15/32" DIA MOUNTING BUSHING, 6 AMPS AT 125 VAC, 3 AMPS AT 250 VAC, SCREW TERM.	1	74D462067 74D462068
E017	PTW2216-N00 MICRO SWITCH	LIGHT, PILOT, GREEN, 1/2" DIA, 120V 110/120 VAC, 50/60 HZ, INCLUDES 27/32" XI-7/8" BLANK ALUM LEGEND PLATE, 11/16" DIA MTG HOLE, USES REPLACEMENT LAMP T-1 3/4 #328	1	74D462067 74D462068

FUEL PUMP TEST STAND (P/N 74D460160-1001) PARTS LIST

ITEM NO.	PART NUMBER MANUFACTURER	DESCRIPTION	QTY	DRAWING/ SCHEMATIC DIAGRAM NO.
E018	1052C5 INDUSTRIAL DEVICES	LIGHT, PILOT, MIDGET, GREEN, LENS 110 VOLTS, 50/60 HZ GREEN LENS MIDGET SERIES	1	74D462067 74D462068
E019	1050C1 INDUSTRIAL DEVICES	LIGHT, PILOT, MIDGET, RED 110 VOLTS, 50/60 HZ, RED LENS, MIDGET SERIES	1	74D462067 74D462068
E020	1050C1 INDUSTRIAL DEVICES	LIGHT, PILOT, MIDGET, RED 110 VOLTS, 50/60 HZ, RED LENS, MIDGET SERIES	1	74D462067 74D462068
E021	PTW2213-N00 MICRO SWITCH	LIGHT, PILOT, RED, 1/2" DIA. 120V 110/120 VAC, 50/60 HZ, INCLUDES 27/32"x1-7/8" BLANK ALUM LEGEND PLATE, 11/16" DIA MTG HOLE, USES REPLACEMENT LAMP T-1 3/4 #328	1	74D462067 74D462068
E022	PTW2213-N00 MICRO SWITCH	LIGHT, PILOT, RED, 1/2" DIA. 120V 110/120 VAC, 50/60 HZ, INCLUDES 27/32"x1-7/8" BLANK ALUM LEGEND PLATE, 11/16" DIA MTG HOLE, USES REPLACEMENT LAMP T-1 3/4 #328	1	74D462067 74D462068
E023	PTW2213-N00 MICRO SWITCH	LIGHT, PILOT, RED, 1/2" DIA. 120V 110/120 VAC, 50/60 HZ, INCLUDES 27/32"x1-7/8" BLANK ALUM LEGEND PLATE, 11/16" DIA MTG HOLE, USES REPLACEMENT LAMP T-1 3/4 #328	1	74D462067 74D462068
E024	PTW2213-N00 MICRO SWITCH	LIGHT, PILOT, RED, 1/2" DIA. 120V 110/120 VAC, 50/60 HZ, INCLUDES 27/32"x1-7/8" BLANK ALUM LEGEND PLATE, 11/16" DIA MTG HOLE, USES REPLACEMENT LAMP T-1 3/4 #328	1	74D462067 74D462068
E025	PTW2216-N00 MICRO SWITCH	LIGHT, PILOT, GREEN, 1/2" DIA. 120V 110/120 VAC, 50/60 HZ, INCLUDES 27/32"x1-7/8" BLANK ALUM LEGEND PLATE, 11/16" DIA MTG HOLE, USES REPLACEMENT LAMP T-1 3/4 #328	1	74D462067 74D462068

FUEL PUMP TEST STAND (P/N 74D460160-1001) PARTS LIST

ITEM NO.	PART NUMBER MANUFACTURER	DESCRIPTION	QTY	DRAWING/ SCHEMATIC DIAGRAM NO.
E026	PTL2217B06 MICRO SWITCH	LIGHT, PILOT, BLUE 110/120 VAC, 50/60 HZ, INCLUDES 2-1/4" SQUARE 'FORWARD' ALUM LEGEND PLATE, TRANSFORMER TYPE, USES LAMP #51	1	74D462067 74D462068
E027	PTSBC202C-B00 MICRO SWITCH	SWITCH, SELECTOR, 2 POS, 1NC CONTACTOR, SCREW TERMINALS, 2.25" BLANK ALUM LEGEND PLATE, WITH BLACK ACTUATOR.	1	74D462067 74D462068
E028	PTL2214B25 MICRO SWITCH	LIGHT, PILOT, AMBER 110/120 VAC, 50/60 HZ INCLUDES 2-1/4" SQUARE '2-1/4" SQUARE 'REVERSE' ALUM LEGEND PLATE, TRANSFORMER TYPE, USE LAMP #51	1	74D462067 74D462068
E029	3190-0001 MCGILL MANUF. CO.	SWITCH, TOGGLE, SPST, 1/4 HP PANEL MOUNTING WITH 15/32" DIA MOUNTING BUSHING, 6 AMPS AT 125 VAC, 3 AMPS AT 250 VAC, SCREW TERM.	1	74D462067 74D462068
E030	3190-0001 MCGILL MANUF. CO.	SWITCH, TOGGLE, SPST, 1/4 HP PANEL MOUNTING WITH 15/32" DIA MOUNTING BUSHING, 6 AMPS AT 125 VAC, 3 AMPS AT 250 VAC, SCREW TERM.	1	74D462067 74D462068
E031	3190-0001 MCGILL MANUF. CO.	SWITCH, TOGGLE, SPST, 1/4 HP PANEL MOUNTING WITH 15/32" DIA MOUNTING BUSHING, 6 AMPS AT 125 VAC, 3 AMPS AT 250 VAC, SCREW TERM.	1	74D462067 74D462068
E032	3190-0001 MCGILL MANUF. CO.	SWITCH, TOGGLE, SPST, 1/4 HP PANEL MOUNTING WITH 15/32" DIA MOUNTING BUSHING, 6 AMPS AT 125 VAC, 3 AMPS AT 250 VAC, SCREW TERM.	1	74D462067 74D462068
E033	PTW2216-N00 MICRO SWITCH	LIGHT, PILOT, GREEN, 1/2" DIA. 120 V 110/120 VAC, 50/60 HZ, INCLUDES 27/32" X 1-7/8" BLANK ALUM LEGEND PLATE, 11/16" DIA MTG HOLE, USES REPLACEMENT LAMP T-1 3/4 #328	1	74D462067 74D462068

FUEL PUMP TEST STAND (P/N 74D460160-1001) PARTS LIST

ITEM NO.	PART NUMBER MANUFACTURER	DESCRIPTION	QTY	DRAWING/ SCHEMATIC DIAGRAM NO.
E034	PTY-4211 MICRO SWITCH	PUSHBUTTON SWITCH, PUSH-PULL, YELLOW 120 VAC, 6A BREAK CURRENT, 2 FORM Z CONTACTS, PULL TO START, PUSH TO STOP TYPE, NEMA 13 ENCLOSURE, SCREW TERMINAL CONNECTIONS, REQUIRES 1-13/64" DIA MTG HOLE, WITH 2-1/4" LEGEND PLATE	1	74D462067 74D462068
E035	SA4884 BECKMAN INDUSTRIAL	POTENTIOMETER WITH LVI 5K, 10 TURN, WIRE WOUND, 5 WATTS AT 40 DEG C, DERATED TO 0 AT 85 DEG C, BUSHING MOUNT WITH SLEEVE BEARING PLASTIC HOUSING 1-13/160D, 1/4" DIA ST STL SHAFT, SOLDERED TERMINALS	1	74D462068
E036	PTY-4216G-B21 MICRO SWITCH	PUSHBUTTON, PUSH-PULL, GREEN 120VAC, 6A BREAK CURRENT, 2 FORM Z CONTACTS, PULL TO START PUSH TO STOP TYPE, NEMA 13 ENCLOSURE, SCREW TERMINAL CONNECTIONS, REQUIRES 1-13/64" DIA MTG HOLE, WITH 2-1/4" LEGEND PLATE, PUSH TO STOP PULL TO START	1	74D462067 74D462068
E037	PTY-4216G-B21 MICRO SWITCH	PUSHBUTTON, PUSH-PULL, GREEN 120VAC, 6A BREAK CURRENT, 2 FORM Z CONTACTS, PULL TO START PUSH TO STOP TYPE, NEMA 13 ENCLOSURE, SCREW TERMINAL CONNECTIONS, REQUIRES 1-13/64" DIA MTG HOLE, WITH 2-1/4" LEGEND PLATE, PUSH TO STOP PULL TO START	1	74D462067 74D462068
E038	PTY-4216G-B21 MICRO SWITCH	PUSHBUTTON, PUSH-PULL, GREEN 120VAC, 6A BREAK CURRENT, 2 FORM Z CONTACTS, PULL TO START PUSH TO STOP TYPE, NEMA 13 ENCLOSURE, SCREW TERMINAL CONNECTIONS, REQUIRES 1-13/64" DIA MTG HOLE, WITH 2-1/4" LEGEND PLATE, PUSH TO STOP PULL TO START	1	74D462067 74D462068
E039	PTY-4216G-B21 MICRO SWITCH	PUSHBUTTON, PUSH-PULL, GREEN 120VAC, 6A BREAK CURRENT, 2 FORM Z CONTACTS, PULL TO START PUSH TO STOP TYPE, NEMA 13 ENCLOSURE, SCREW TERMINAL CONNECTIONS, REQUIRES 1-13/64" DIA MTG HOLE, WITH 2-1/4" LEGEND PLATE, PUSH TO STOP PULL TO START	1	74D462067 74D462068

FUEL PUMP TEST STAND (P/N 74D460160-1001) PARTS LIST

ITEM NO.	PART NUMBER MANUFACTURER	DESCRIPTION	QTY	DRAWING/ SCHEMATIC DIAGRAM NO.
E040	65041K-206 SWITCHCRAFT INC.	SWITCH, SELECTOR, 4 POS, 125V 2PDT CONTACTS RATED AT 3 AMPS, 125V, PUSHBUTTON TYPE WITH LOCK OUT, SOLDER TERMINALS	1	74D462067 74D462068
E041	10K6A SYS. DAYTRONIC CORP.	SYSTEM DATA, ACQUISITION CONSISTS OF, 10K6A DATAPAC, L-OPTION, LIMPAC (SOFTWARE), LMOD TO 10BCP100, AND X1 MOD TO 10BCP100	1	74D462068
E042	LQ-850 EPSON AMERICA INC.	PRINTER, RS232 PORT	1	74D462067 74D462068
E043	3190-001 MCGILL MANUF.CO.	SWITCH, TOGGLE, SPST, 1/4 HP. PANEL MOUNTING WITH 15/32" DIA MOUNTING BUSHING, 6 AMPS AT 125 VAC, 3 AMPS AT 250 VAC, SCREW TERM.	1	74D462067
E201	1615K-2K EATON CORP.	XDUCR, 0-2KIN, LB, 15KRPM +/- .05% OF RT RPTLY, +/- .1% OF RT NO LIN., STN GAGBR, XFORMER CPLD, 2-2.5MV/V OPUT 3-4KHZACRMS EXT .MS3102E-1 4S-5P CONN PROV. FOR SPD PKUP 65-200F, AND20002 & AND10262 20/30P 24T 30DEG PRES AGL MTS C/W CALIBRATION REST.	1	74D462069 74D462068
E501	S13628PD40Z180 MINCO PRODUCTS	RTD, 100 OHM, 4" X 3/16" ST. STL. SHEATH, PLATINUM ELEMENT, 15FT SS BRAIDED 3-WIRE LEADS, ALPHA = 0.00385	1	74D462069 74D462068
E502	B121-120 UNITED ELEC. CONT.	SWITCH - TEMP. UUT TANK TEMP, SET @ 90 DEGREES F RISING. MODEL NO. 9006	1	74D462069 74D462068
E503	32420-X ATKOMATIC VALVE CO.	VALVE, 2W2P, 1500PSI, 1/2" NPTF, PISTON TYPE, CV=3.5, MIL-C-702 G SERVICE, BRONZE BODY, EXPLOSION-PROOF (CLASSI GROUP C&D) HOUSIN G NORMALLY OPEN, BUNA N SEAL, 150 DEG F MAX, IN-LINE MTG, HORIZ PORTS, SOLENOID OPERATED, 115V, 60HZ, 10 MILLISEC MAX CLOSING	1	74D462069 74D462068

FUEL PUMP TEST STAND (P/N 74D460160-1001) PARTS LIST

ITEM NO.	PART NUMBER MANUFACTURER	DESCRIPTION	QTY	DRAWING/ SCHEMATIC DIAGRAM NO.
E504	8012AM2DDA20 VIATRAN CORP.	TRANSMITTER, 0-100PSI, 0.25% FS ACCURACY, 4-20MA OPUT, 14-45VDC POWER INPUT, ST. STL. PRESSURE CAPSULE, BUNA-N SEALS, 200PSI PROOF, 1/2" NPTF CONNT, 1/2" NPTF CONDUIT CONNT, 4:1 RANGING, SCREWDRIVER RANGE ADJUST, WITH CALB. PTS. AT 20% AND 100%.	1	74D462069 74D462068
E505	S13628PD40Z180 MINCO PRODUCTS	RTD, 100 OHM, 4" X 3/16" ST. STL. SHEATH, PLATINUM ELEMENT, 15FT SS BRAIDED 3-WIRE LEADS, ALPHA = 0.00385	1	74D462069 74D462068
E506	8012BA2DDA20 VIATRAN CORP.	TRANSMITTER, 0-2000PSI, 0.25% FS ACCURACY, 4-20MA OPUT, 14-45VDC POWER INPUT, ST. STL. PRESSURE CAPSULE, BUNA-N SEALS, 4000 PSI PROOF, 1/2" NPTF CONNT, 1/2" NPTF CONDUIT CONNT, 4:1 RANGING, SCREWDRIVER RANGE ADJ. WITH CALB PTS AT 20% AND 100%	1	74D462069 74D462068
E507	32420-X ATKOMATIC VALVE CO.	VALVE, 2M2P, 1500PSI, 1/2" NPTF, PISTON TYPE, CV=3.5, MIL-C 7024 SERVICE, BRONZE BODY, EXPLOSION-PROOF (CLASSI GRP C&D) HOUSING, NORMALLY OPEN, BUNA-N SEAL, 150 DEG G MAX, IN-LINE MTG HORZ. PORTS, SOLENOID OPR. 115V, 60HZ, 10MILLISEC MAX COSING TIME	1	74D462069 74D462068
E508	8012AP2DDA20 VIATRAN CORP.	TRANSMITTER, 0-200PSI, 0.25% FS ACCURACY, 4-20MA OPUT, 14-45VDC POWER INPUT, ST. STL. PRESSURE CAPSULE, BUNA-N SEALS, 400 PSI PROOF, 1/2" NPTF CONNT, 1/2" NPTF CONDUIT CONNT, 4:1 RANGING, SCREWDRIVER RANG ADJUST, W/CALB. POINTS AT 20% AND 100%	1	74D462069 74D462068
E509	8012AR2DDA20 VIATRAN CORP.	TRANSMITTER, 0-300PSI, 0.25% FS ACCURACY, 4-20MA OPUT, 14-45VDC POWER INPUT, ST. STL. PRESSURE CAPSULE, BUNA-N SEALS, 600 PSI PROOF, 1/2" NPTF CONNT, 1/2" NPTF CONDUIT CONNT, 4:1 RANGING, SCREWDRIVER RANG ADJUST, W/CALB. POINTS AT 20% AND 100%	1	74D462069 74D462068
E510	32420-X ATKOMATIC VALVE CO.	VALVE, 2M2P, 1500PSI, 1/2" NPTF, PISTON TYPE, CV=3.5, MIL-C 7024 SERVICE, BRONZE BODY, EXPLOSION-PROOF (CLASSI GRP C&D) HOUSING, NORMALLY OPEN, BUNA N SEAL, 150 DEG F MAX, IN-LINE MTG, HORZ. PORTS, SOLENOID OPER., 115V, 60HZ, 10 MILLISEC MAXCLOSING TIME	1	74D462069 74D462068

FUEL PUMP TEST STAND (P/N 74D460160-1001) PARTS LIST

ITEM NO.	PART NUMBER MANUFACTURER	DESCRIPTION	QTY	DRAWING/ SCHEMATIC DIAGRAM NO.
E511	S13628PD40Z180 MINCO PRODUCTS	RTD, 100 OHM, 4" X 3/16" ST.STL. SHEATH, PLATINUM ELEMENT, 15FT SS BRAIDED 3-WIRE LEADS, ALPHA = 0.00385	1	74D462069 74D462068
E512	B121-120 UNITED ELEC. CONT.	SWITCH - TEMP -100 TO 0 - 400 DEGREES F. 10 AMP - 115VAC 5 AMP - 230 VAC, SET TO CLOSE ON TEMP. RISE. UUT INLET TEMP SET @ 90 DEGREES F. RISING. MODEL #9006	1	74D462067 74D462068
E513	H122-553 UNITED ELEC. CONT.	SWITCH - PRESSURE, 0-20 PSIG, MODEL #95371 PUMP INLET PRESSURE, SET @ 5 PSIG FALLING.	1	74D462069 74D462068
E514	8012AP2DDA20 MINCO PRODUCTS	RTD, 100 OHM, 4" X 3/16" ST.STL. SHEATH, PLATINUM ELEMENT, 15FT SS BRAIDED 3-WIRE LEADS, ALPHA = 0.00385	1	74D462069 74D462068
E515	8012APZDA20 VIATRAN CORP.	TRANSMITTER, 0-200PSI, 0.25% FS ACCURACY, 4-20MA OPUT, 14-45 VDC POWER INUPT, ST.STL.PRESSURE CAPSULE, BUNA-N SEALS, 200 PSI PROOF, 1/2"NPTF CONNT. 1/2"NPTF CONDUIT CONNT. 4.1RANGING SCREWDRIVER RANGE ADJ. W/CALB. POINTS AT 20% AND 100%	1	74D462069 74D462068
E516	S13628PD40Z180 MINCO PRODUCTS	RTD, 100 OHM, 4" X 3/16" ST.STL. SHEATH, PLATINUM ELEMENT, 15FT SS BRAIDED 3-WIRE LEADS, ALPHA = 0.00385	1	74D462069 74D462068
E517	8022AH5DDA20 VIATRAN CORP.	TRANSDUCER, 0-50PSID, 0.25% FS ACCURACY, 5000PSI MAX LINE PRESSURE, 14-45V DC INPUT, 4-20 MA OPUT, +/-25% LINEARTY, +/- 25% SPAN AND ZERO ADJUST, INTERNAL SWITCH FOR 100% CALB. SIGNAL, BUNA-N SEALS, EXPLOSION PROOF.	1	74D462069 74D462068
E518	8022AP5DDA20 VIATRAN CORP.	TRANSDUCER, 0-200PSID, 2.25% FS ACCURACY, 5000PSI MAX LINE PRESSURE, 14-45V DC INPUT, 4-20MA OPUT, +/-25% LINEARTY, +/- 25% SPAN AND ZERO ADJUST, INTERNAL SWITCH FOR 100% CALB. SIGNAL, BUNA-N SEALS, EXPLOSION PROOF.	1	74D462069 74D462068

FUEL PUMP TEST STAND (P/N 74D460160-1001) PARTS LIST

ITEM NO.	PART NUMBER MANUFACTURER	DESCRIPTION	QTY	DRAWING/ SCHEMATIC DIAGRAM NO.
E519	H122-553 UNITED ELEC. CONT.	SWITCH - PRESSURE, 0-20 PSIG, MODEL 95371 WATER PRESSURE, SET @ 15 PSIG FALLING	1	74D462069 74D462068
E520	8012AR2DDA20 VIATRAN CORP.	TRANSMITTER, 0-300PSI, 0.25% FS ACCURACY, 4-20MA OPUT, 14-45 VDC POWER INPUT, ST. STL. PRESSURE CAPSULE, BUNA-N SEALS, 600 PSI PROOF, 1/2" NPTF CONNTS., 1/2" NPTF CONDUIT CONNT. 4:1 RANG. SCREWDRIVER RANG ADJUST, W/CALB. POINTS AT 20% AND 100%	1	74D462069 74D462068
E522	8012AM2DDA20 VIATRAN CORP.	TRANSMITTER, 0-100PSI, 0.25% FS ACCURACY, 4-20MA OPUT, 14-45 VDC POWER INPUT, ST. STL. PRESSURE CAPSULE, BUNA-N SEALS, 200 PSI PROOF, 1/2" NPTF CONNTS. 1/2" NPTF CONDUIT CONNT. 4:1 RANG ING, SCREWDRIVER RANGE ADJUST, W/CALB. POINTS AT 20 & 100%	1	74D462069 74D462068
E523	ASSY (SEE BELOW)	STARTER/OL ASSY, SIZE 0 CONSISTS OF: 3 POLE 3 PHASE STARTER AND 3 EA. HEATER, 6.33 TO 6.81 FLA.	1	74D462069
E523-1	14CP32AA FURNAS ELECTRIC CO.	STARTER, MAGNETIC, AC, SIZE 0 3 PHASE, 3 POLE, 600VAC MAX 50/60HZ, OPEN HOUSING, 3HP @ 200/230V, 5 HP @ 460/575V, 3 MELTING ALLOY OVERLOADS REQUIRED, 110/240V 50/60HZ COIL	1	74D462069
E523-2	48DC31AA3 FURNAS ELECTRIC CO.	HEATER, OVERLOAD, H29	3	74D462069
E524	1950-1 DNYER INSTRUMENTS	SWITCH, PRES., 0.4-1.6. "WC 1 SPDT CONTACT RTD 15A @125/480VAC 10PSI MAX, 0-20MC DEAD BAND, FLOURSILICONE RUB. DIAPHR. 1/8" NPTF PRES. CONNT. EXPL/WEATHER PRF ENCL, SCREW TERM. CONNTS. 1/2" NPT T CONDUIT CONNT. PRG. AIR FOR E525 DRV MOTOR, SET @ 1.0" WC FAL	1	74D462069 74D462068

FUEL PUMP TEST STAND (P/N 74D460160-1001) PARTS LIST

ITEM NO.	PART NUMBER MANUFACTURER	DESCRIPTION	QTY	DRAWING/ SCHEMATIC DIAGRAM NO.
E525	ASSY (SEE BELOW)	DRIVE SYSTEM, AC, 150HP CONSISTS OF: AC MOTOR & CONTROLLER VAR SPEED.	1	74D462067 74D462068
E525-1	7-N08972-001 LOUIS ALLIS	MOTOR, AC, 150HP, 8000RPM CLASS I GROUP D EXPL. PROOF, FRAME WITH NEMA C FLANGE AND FEET, WITH THERMAL SWITCH, MOTOR MOUNTED EXPL PROOF BLOWER, OIL MIST LUB. AND PRECISION BALANCED	1	74D462067 74D462068
E525-2	AS5112 EMERSON ELEC. CO.	CONTROLLER, DRIVE, AC, 150HP 460V, 3PH, 60HZ, DYNAMIC BRAKING, AND NEMA 1 CABINET. (MODIFIED BY P.C. UPTIME INC.)	1	74D462067 74D462067
E526	4251F12P1BA00 AMOT CONTROLS	SWITCH - TEMP/PRESS, PRESS RANGE 0-20PSIG, TEMP.SET POINT, 5 PSIG FALLING & 90 DEGREES F. RISING. LUBE OIL PRES./TEMP SET PRES. @ 5 PSIG AND TEMP @ 90 DEGREES F.	1	74D462069 74D462068
E527	H121-126 UNITED ELECTRIC	SWITCH - PRESSURE, RANGE: 30"HG VAC TO 0 PSIG, MODEL # 95083	1	74D462069 74D462068
E528	H122-358 UNITED ELECTRIC	SWITCH - PRESSURE, RANGE: 0 TO 200 PSIG. SHOP AIR, SET @ 80 PSIG FALLING. MODEL #95478.	1	74D462069 74D462068
E529	1950-04 Dwyer Instruments	SWITCH, PRES., .03-.35" SET @ 1 WC F. 1 SPDT CONTACT RTD @ 125/480VAC, 10PSI MAX, 0.20"WC DEAD BAND, FLOURSILICONE RUBBER DIAPHRAGM, 1/8"NPTF PRES. CONNT. EXPLOSION/WEATHER PROOF ENCLOSURE, SCREW TERMINAL CONNT. 1/2"NPT CONDUIT CONNT.	1	74D462068 74D462069
E530	7848 SYSTRON DONNNER	SWITCH, PRESSURE, VERIFIES HALON RELEASE TO CONTROL PANEL WHEN SYSTEM ACTIVATES. PRESSURE SET @ 30 PSIG FALLING	1	74D462068

FUEL PUMP TEST STAND (P/N 74D460160-1001) PARTS LIST

ITEM NO.	PART NUMBER MANUFACTURER	DESCRIPTION	QTY	DRAWING/ SCHEMATIC DIAGRAM NO.
E531	ASSY (SEE BELOW)	STARTER/OL ASSY, SIZE 0 CONSIST OF: 3 POLE 3 PHASE STARTER AND 3 EA. HEATER, 6.33 TO 6.81 FLA	1	74D462068 74D462068
E531-1	14CP32AA FURNAS ELECTRIC CO.	STARTER, MAGNETIC, AC, SIZE 0 3 PHASE, 3 POLE, 600 VAC MAX, 50/60HZ, OPEN HOUSING, 3 HP @ 200/230V, 5HP @ 460/575V, 3 MELTING ALLOY OVERLOADS REQUIRED, 110/240V 50/60HZ COIL	1	74D462068 74D462068
E531-2	48DC31AA3 FURNAS ELECTRIC CO.	HEATER, OVERLOAD, H29	3	74D462068 74D462068
E532	ASSY (SEE BELOW)	STARTER/OL ASSY, SIZE 3 CONSISTS OF: 3 POLE 3 PHASE STARTER AND 3EA, HEATERS 40.8 TO 44.3 AMP	1	74D462068
E532-1	14HP32AA FURNAS ELECTRIC CO.	STARTER, MAGNETIC, AC, SIZE 3 3 PHASE, 3 POLE, 600VAC MAX 50/60HZ, OPEN TYPE, 25HP @ 200V, 30HP @230V, 50HP @ 460/575 V, 3 OVERLOADS REQUIRED, 110-120/220-240 V/60HZ 110/190-220V/50 HZ COIL	1	74D462068
E532-2	48HC31AA3 FURNAS ELECTRIC CO.	HEATER, OVERLOAD, H45	3	74D462068
E533	J120-451/95792 U. E. CONTROLS CO.	SWITCH - PRESSURE, RANGE: 2" TO 80" WC SET @ LOW LEVEL	1	74D462069 74D462068
E534	8320A20 AUTOMATIC SWITCH	VALVE, 3W2P, 125PSI, 1/4" NPTF, POPPET TYPE, CV=0.09, LOW LEAK-AGE, AIR OR LIQUID SERVICE, BRASS BODY, NORMALLY CLOSED, BUNA-SEAL, 180 DEG F MAX, BRACKET MTG SOLENOID OPERATED, 120/110V 60/50HZ, 6 WATTS, ELPL. PROOF.	1	74D462069 74D462068

FUEL PUMP TEST STAND (P/N 74D460160-1001) PARTS LIST

ITEM NO.	PART NUMBER MANUFACTURER	DESCRIPTION	QTY	DRAWING/ SCHEMATIC DIAGRAM NO.
E535	ASSY (SEE BELOW)	STARTER/OL ASSY, SIZE 00 CONSISTS OF: 3 POLE STARTER AND 3 EA. HEATER. 3.26 TO 3/60 FLA.	1	74D462069 74D462068
E535-1	14BP32AA FURNAS ELECTRIC CO.	STARTER, MAGNETIC SIZE 00	1	74D462069 74D462068
E535-2	48DC31AA3 FURNAS ELECTRIC CO.	HEATER, OVERLOAD, H23	3	74D462069 74D462068
E536	ASSY (SEE BELOW)	STARTER/OL ASSY, SIZE 00 CONSIST OF: 3 POLE 3 PHASE STARTER AND 3EA. HEATERS, 0.93 TO 1.02 AMP	1	74D462068
E536-1	14BP32AA FURNAS ELECTRIC CO.	STARTER, MAGNETIC, AC, SIZE 00	1	74D462068
E536-2	H10 FURNAS ELECTRIC CO.	HEATER, OVERLOAD, H10	3	74D462068
E537	W388ACQX-9 MAGNACRAFT ELECTRIC	RELAY, CONTROL, DPDT ENCLOSED, FLANGE MTG, 12 AMP, CONTACTS, QUICK-CONNECT, 110/120V 50/60 HZ, COIL	1	74D462068
E538	W388ACQX-9 MAGNACRAFT ELECTRIC	RELAY, CONTROL, DPDT ENCLOSED, FLANGE MTG, 12 AMP, CONTACTS, QUICK-CONNECT, 110/120V, 50/60 HZ, COIL	1	74D462068
E539	S13628PD40Z180 MINCO PRODUCTS	RTD, 100 OHM, 4" X 3/16" ST. STL. SHEATH, PLATINUM ELEMENT, 15FT SS BRAIDED 3-WIRE LEADS, ALPHA = 0.00385	1	74D462069

FUEL PUMP TEST STAND (P/N 74D460160-1001) PARTS LIST

ITEM NO.	PART NUMBER MANUFACTURER	DESCRIPTION	QTY	DRAWING/ SCHEMATIC DIAGRAM NO.
E540	EX-AR-8838 MICRO SWITCH	SWITCH, LIMIT, XP, SPRING RETURN CLOCKWISE OR COUNTERCLOCKWISE, LEVER TYPE, MAX 16 DEG TRAVEL TO OPERATE, 42 DEG MAX TRAVEL, 9 DEG TRAVEL TO RESET NO CONTACT	1	74D462069 74D462068
E542	ASSY (SEE BELOW)	SWITCH ASSY, LIQ. LEVEL CONSIST OF SINGLE STATION SWITCH GEMS P/N LS-01801 (#2) AND 1-1/4NPT MOUNTING PLUG GEMS P/N 26034	1	74D462069 74D462068
E542-1	LCS-S200-BB FLUID PROD. CO. INC.	SWITCH, LIQUID LEVEL, SINGLE STATION, 1/8" NPT CONNECTION, 2-3/4" OAL, BUNA N FLOAT, BRASS STEM, SPST, 15 WATT, NC OR NO OPERATION BY INVERTING FLOAT	1	
E542-2	272-L TURTLE & HUGHES	BOX, BELL, 272L, 5-1/2", HUBS MP	1	
E542-3	240-AL TURTLE & HUGHES	PLATE, COVER, BLACK, 240-AL	1	
E542-4	2520 THOMAS & BETTS	CONN, EL, LT, STRN, 1/2", 1/8-1/4	1	
E542-5	DOUBLE TAP UNITED PIPE & NIPPLE	BUSHING, RED, BLK, DBLTP, 1.25X1/2	1	
E542-6	604(3/8X1/2) NIBCO INC.	ADAPTER, CU, CXM, 3/8"X 1/2"	1	

FUEL PUMP TEST STAND (P/N 74D460160-1001) PARTS LIST

ITEM NO.	PART NUMBER MANUFACTURER	DESCRIPTION	QTY	DRAWING/ SCHEMATIC DIAGRAM NO.
E542-7	603(3/8X1/4) NIBCO INC.	ADAPTER, CU, CXF, 3/8"X1/4"	1	
E542-8	COMMERCIAL UNITED PIPE & NIPPLE	BUSHING, RED, BR, 1/4	1	
E542-9	COMMERCIAL TURTLE & HUGHES	NIPPLE,CLOSE, OLV, 1/2"	1	
E543	ASSY (SEE BELOW)	SWITCH ASSY, LIQ. LEVEL CONSIST OF SINGLE STATION SWITCH GEMS P/N LS-01801 (#2) AND 1-1/4NPT MOUNTING PLUG GEMS P/N 26034	1	74D462069 74D462068
E543-1	LCS-S200-DB FLUID PROD. CO. INC.	SWITCH, LIQUID LEVEL, SINGLE STATION, 1/8" NPT CONNECTION 2-3/4" OAL, BUNA-N FLOAT, BRASS STEM, SPST, 15 WATT NC OR NO OPERATION BY INVERTING FLOAT	1	74D462069 74D462068
E543-2	272-L TURTLE & HUGHES	BOX, BELL, 272L,5-1/2", HUBS MP	1	74D462069 74D462068
E543-3	240-AL TURTLE & HUGHES	PLATE, COVER, BLANK, 240-AL	1	74D462069 74D462068
E543-4	2520 THOMAS & BETTS	CONN, EL, LT, STRN, 1/2", 1/8-1/4	1	74D462069 74D462068
E543-5	COMMERCIAL UNITED PIPE & NIPPLE	BUSHING, RED, BLK, DBLTP, 1.25X1/2	1	74D462069 74D462068

FUEL PUMP TEST STAND (P/N 74D460160-1001) PARTS LIST

ITEM NO.	PART NUMBER MANUFACTURER	DESCRIPTION	QTY	DRAWING/ SCHEMATIC DIAGRAM NO.
E543-6	604(3/8X1/2) NIBCO INC.	ADAPTER, CU, CXM, 3/8"X1/2"	1	74D462069 74D462068
E543-7	603(3/8X1/4) NIBCO INC.	ADAPTER, CU, CX, 3/8"X 1/4"	1	74D462069 74D462068
E543-8	COMERCIAL UNITED PIPE & NIPPLE	BUSHING, RED, BR, 1/4"X 1/8"	1	74D462069 74D462068
E543-9	COMMERCIAL TURTLE & HUGHES	NIPPLE,CLOSE, GLV, 1/2"	1	74D462069 74D462068
E544	EMA-18/24D POWERMATE CORP.	POWER SUPPLY, 24VDC, 6.5A +/- 0.1% REGULATION, 18V @ 7/1A, 20V @ 6.5A, REMOTE SENSING, 125/250 VAC, 50/60HZ INPUT (DERATE OUTPUT CURR 10% FOR 50HZ OPERATION), SCREW TERMINAL OUTPUT CONNECTIONS, OPEN FRAME.	1	74D462068
E545	8320A20 AUTOMATIC SWITCH CO.	VALVE, 3M2P,125PSI, 1/4" NPTF, POPPET TYPE, CV=0.09, LOW LEAKAGE, AIR OR LIQUID SERVICE, BRASS BODY, NORMALLY CLOSED, BUNA N SEAL, 180 DEG F MAX, BRACKET MTG, SOLENOID OPERATED, 120/110V, 60/50 HZ, 6 WATTS,, EXPL. PROOF	1	74D462069 74D462068
E546	8320A20 AUTOMATIC SWITCH CO.	VALVE, 3M2P,125PSI, 1/4" NPTF, POPPET TYPE, CV=0.09, LOW LEAKAGE, AIR OR LIQUID SERVICE, BRASS BODY, NORMALLY CLOSED, BUNA N SEAL, 180 DEG F MAX, BRACKET MTG, SOLENOID OPERATED, 20/110V, 60/50 HZ, 6 WATTS, EXPL. PROOF	1	74D462069 74D462068
E547	8320A20 AUTOMATIC SWITCH CO.	VALVE, 3M2P,125PSI, 1/4" NPTF, POPPET TYPE, CV=0.09, LOW LEAKAGE, AIR OR LIQUID SERVICE, BRASS BODY, NORMALLY CLOSED, BUNA N SEAL, 180 DEG F MAX, BRACKET MTG, SOLENOID OPERATED, 20/110V, 60/50 HZ, 6 WATTS, ELPL. PROOF	1	74D462069 74D462068

FUEL PUMP TEST STAND (P/N 74D460160-1001) PARTS LIST

ITEM NO.	PART NUMBER MANUFACTURER	DESCRIPTION	QTY	DRAWING/ SCHEMATIC DIAGRAM NO.
E548	8320A20 AUTOMATIC SWITCH CO.	VALVE, 3M2P, 125PSI, 1/4" NPTF, POPPET TYPE, CV=0.09 LOW LEAKAGE, AIR OR LIQUID SERVICE, BRASS BODY, NORMALLY CLOSED, BUNA N SEAL, 180 DEG F MAX, BRACKET MFG, SOLENOID OPERATED, 20/110V, 60/50 HZ, 6 WATTS, ELPL. PROOF	1	74D462069 74D462068
E550	5902-01 SYSTRON DONNER	MODULE, CONTROL; RECEIVES DETECTION SIGNALS, CONTROL SIGNAL PROCESSING AND PROVIDES RELAY OUTPUTS TO ACTUATE ALARMS, EMERGENCY SHUTDOWN AND EXTINGUISHING RELEASE.	1	74D462068
E551	5901-04 SYSTRON DONNER	MODULE, DISPLAY; PROVIDES ANNUNCIATION OF SYSTEMS CONDITIONS	1	74D462068
E552	50-60009 SYSTRON DONNER	SUPPLY, POWER, 24V, DOES NOT EXCEED 5.8A AT 50 DEG C, 4A AT 60 DEG C, AND 2.3A AT 71 DEG C.	1	74D462068
E553	ASSY (SEE BELOW)	FUSE BLOCK ASSY, 15A, 500V CONSISTS OF: FUSE BLOCK(#C6M30-3S) AND 3 EA. FUSE (#CNQ-15).	1	74D462068
E553-1	C6M30-3S CEFCO	BLOCK, FUSE, MIDGET, 600V, 30A, 3PL	1	74D462068
E553-2	CNQ-15 CEFCO	FUSE, TIME DELAY, 500V, 15.00A	3	74D462068
E554	ASSY (SEE BELOW)	FUSE/BLOCK ASSY, 60A, 600V CONSISTS OF: FUSE BLOCK(#C6H60-3CR AND 3EA. FUSE (#CRS-R60).	1	74D462068

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ITEM NO.	PART NUMBER MANUFACTURER	DESCRIPTION	QTY	DRAWING/ SCHEMATIC DIAGRAM NO.
E554-1	C6H60-3CR CEFCO	BLOCK, FUSE, PHENLC, 600V, 60A, 3P	1	
E554-2	CRS-R60 CEFCO	FUSE, DUAL ELEMENT, 600V, 60.00A	3	
E555	ASSY (SEE BELOW)	FUSE/BLOCK ASSY, 20A, 600V CONSIST OF: BLOCK (#C6H60-3CR) AN 3 FUSES (#CRS-20)	1	74D462068
E555-1	C6H60-3CR CEFCO	BLOCK, FUSE, PHENLC, 600V, 60A, 3P	1	
E555-2	CRS-20 CEFCO	FUSE, DUAL ELEMENT, 600V, 20.00A	3	
E556	ASSY (SEE BELOW)	FUSE/BLOCK ASSY, 2A, 500V CONSIST OF: 3EA. FUSE (#CNQ-2) AND 1EA. BLOCK (#M30A3S)	1	74D462068
E556-1	6M30A3S MARATHON ELEC. CO.	HOLDER, FUSE, BARRIER TYPE 600V, 30AMPS, SCREW TERMINALS, 3 POLE, COPPER ALLOY TIN-PLATED CLIPS	1	
E556-2	CNQ-2 CEFCO	FUSE, TIME DELAY, 500V, 2A	3	
E557	ASSY (SEE BELOW)	FUSE/BLOCK ASSY, 8A, 500V CONSIST OF: FUSE BLOCK (#C6M30-3S) AND 3 EA FUSE (#CNQ-8)	1	74D462068

FUEL PUMP TEST STAND (P/N 74D460160-1001). PARTS LIST

ITEM NO.	PART NUMBER MANUFACTURER	DESCRIPTION	QTY	DRAWING/ SCHEMATIC DIAGRAM NO.
E557-1	C6M30-3S CEFCO	BLOCK, FUSE, MIDGET, 600V, 30A, 3PL	1	
E557-2	CNQ-8 CEFCO	FUSE, TIME DELAY, 500V, 8.00A	3	
E558	ASSY (SEE BELOW)	FUSE/BLOCK ASSY, 3AMP, 600V CONSIST OF: FUSE BLOCK (6M30A2S) AND FUSE (#CNQ-3)	1	74D462068
E558-1	6M30A2S MARATHON ELEC. CO.	HOLDER, FUSE, BARRIER TYPE FERRULE CLIP, PANEL MTG 13/32" DIA 1/2" LG, SCREW CONNECTORS COPPER ALLOY, TIN PLATED CLIPS, (2) 11/64" HOLES 3/4" APART, 600V, 2 POLE, 30AMPS	1	
E558-2	CNQ-3 CEFCO	FUSE, TIME DELAY, 500V, 3.00A	2	
E559	ASSY (SEE BELOW)	FUSE/BLOCK ASSY, 3AMP, 600V CONSIST OF: FUSE BLOCK (6M30A2S) AND FUSE (#CNQ-3)	1	74D462068
E559-1	6M30A2S MARATHON ELEC. CO.	HOLDER, FUSE, BARRIER TYPE FERRULE CLIP, PANEL MTG 13/32" DIA X 1 1/2" LG, SCREW CONNECTORS COPPER ALLOY, TIN PLATED CLIPS, (2) 11/64" HOLES 3/4" APART, 600V, 2 POLE, 30 AMPS	1	
E559-2	CNQ-3 CEFCO	FUSE, TIME DELAY, 500V 3.00A	2	
E560	TA-1-81218 ACME TRANSFORMER	TRANSFORMER, CONTROL, 1500 VAC 80 DEG C RISE INSULATION SYSTEM, 220/440, 230/460, 240/480V PRIMARY, 110, 115, 120V SECONDARY, 50/60 HZ, 13.05 AMPS OUTPUT, HEIGHT: 41LBS	1	74D462068